

**Morphosyntactic Development of Typically- and Atypically-
developing Bangla-speaking Children**

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degree of Doctor of Philosophy

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To,

*Both my families,
for happily accommodating
all the disruptions a PhD may cause.*

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Abstract

Aims: Verb morphology, arguably, is identified as an area of exceptional challenge for the language development of both young typically-developing children, and children with language difficulties (Leonard, 2014a; Rice & Wexler, 2001). The developmental patterns of verb acquisition are found to be strongly governed by the typological properties of the ambient language; often language errors found in fusional languages (e.g. English and German) are significantly different from those found in agglutinative languages (e.g. Turkish and Tamil) (cf. Phillips, 2010). Therefore, the purpose of the study was to explore the developmental trends in the acquisition of verb morphology in Bangla, a language with agglutinative features. The first objective was to examine the morphosyntactic development of typically-developing (TD) Bangla-speaking children with regard to three verb forms, namely the Present Simple, the Present Progressive and the Past Progressive. A second objective was to examine the development of the three verb forms among a group of children with language impairment (LI).

Rationale: Since Bangla is spoken by a large population, the acquisition data of Bangla represents a significant number of people, and the findings from the acquisition studies, when considered for intervention purposes, serve a considerably large population. Also, given that the normative data of language acquisition is unavailable for Bangla which leads to the absence of a language-specific assessment and intervention for LI children, the present study is expected to have importance for Bangla-speaking contexts.

Method: Before the main study commenced, a pilot study was conducted with 19 Bangla-speaking TD children aged between two and four (years) in order to explore the developmental characteristics of the verb forms and to evaluate the research instruments identified for the actual study.

The main study included 70 TD children between 1;11 and 4;3 years who were recruited from six daycare centres of Dhaka, Bangladesh. The children participated in three elicitation tasks, each to elicit one verb form, and a 20-minute play session that yielded a spontaneous language sample from each child. The researcher scored children's performances on the three tasks, and transcribed the language samples using transcription software (Systematic Analysis of Language Transcripts). The elicitation tasks were used to

determine children's mastery of the forms, whereas the language samples were used to calculate a set of language measures associated with morphological development.

The study also included a group of nine children with LI between 3;11 and 9;4 years who participated in the same set of tasks as the TD children. These children were recruited from a special school in Dhaka.

Findings: The results revealed that, for both TD and LI children, the Present Simple form was acquired with highest accuracy which was followed by the scores in the Present Progressive and the Past Progressive forms respectively. The error patterns indicated a qualitative progress even in children's errors, which was consistent with the accuracy rates of the target forms. Based on the TD children's performance on the three tasks, a developmental sequence for the three Bangla verb forms was proposed.

Results also identified that Mean length of Utterance (MLU) did not have stronger associations with the tasks scores than did Age. Among the determinants tested, Bound Morpheme Type (BMT) was identified to have the strongest associations with the task scores.

Analyses of the data from the LI children revealed a significant difference between the TD and the LI children on all three tasks and the other language measures. When compared against the proposed developmental stages, the children within the LI group were found to differ in terms of their morphosyntactic capacities. A sub-group of LI children also did not conform to any stages of typical development.

Conclusions: Results of the present study offer directions for future investigations in a wide range of areas of Bangla morphosyntax that need to be examined with both TD and LI children. Moreover, factors associated with language development that the present study did not examine (e.g. the role of input) also need to be addressed in future studies. Above all, there is a strong need for ongoing investigations in order to identify a comprehensive picture of morphosyntactic development of Bangla-speaking TD children, which can then lead to the assessment of a range of language impairments in Bangla.

Keywords: Bangla, language acquisition, language impairment, morphosyntax, language typology

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List of Abbreviations

-3s	3rd person singular –s
ACC	Accusative (case)
ADHD	Attention Deficit Hyperactivity Disorder
Adv	Adverb
AdvP	Adverb Phrase
AGR	Agreement
ANOVA	ANalysis Of VAriance
ART	Auditory Repetition Task
ASD	Autism Spectrum Disorder
ATOM	Agreement/Tense Omission Model
BMT	Bound Morpheme Type
CI	Confidence Interval
Det	Determiner
DMCH	Dhaka Medical College and Hospital
DP	Determiner Phrase
EOI	Extended Optional Infinitive
ESLI	English-speaking children with Specific Language Impairment
EUCC	Extended Unique Checking Constraint
IQ	Intelligence Quotient
LI	Language Impairment
M	Mean
MLU	Mean Length of Utterance

MLU_{adj}	Adjusted Mean Length of Utterance
MLU_m	Mean Length of Utterance in Morphemes
MLU_w	Mean Length of Utterance in Words
N	Noun
NLI	Nonspecific Language Impairment
NP	Noun Phrase
OI	Optional Infinitive
OME	Otitis media with effusion
OoA	Order of acquisition
PastProg	Past Progressive
Perf	Perfect
PLI	Pragmatic Language Impairment
PresProg	Present Progressive
Prog	Progressive
PS	Present Simple
S	Sentence
SALT	Systematic Analysis of Language Transcripts
SB	Standard Bangla
SD	Standard Deviation
SE B	Standard Error of Beta
SLI	Specific Language Impairment
SOV	Subject-Object-Verb
T	Tense

TBM	Total Bound Morphemes
TD	Typically developing
TNU	Total Number of Utterances
TNW	Total Number of Words
UCC	Unique Checking Constraint
V	Verb
VP	Verb Phrase
WF	Wrong Form

Chapter One

On the Acquisition of Verb Inflections

The task of language learning is one of children's earliest and most amazing accomplishments. Identifying parts of language from continuous streams of sounds, deciphering the meaning and mastering the underlying system within the first few years of life must be one of the most intriguing facts of human development. Language researchers have sought to better understand children's language acquisition in order to both unearth the mystery behind and to apply the knowledge to resolving real-life issues like developing interventions to help children with language difficulties. Currently the acquisition literature is extensive and as might be expected, a lack of consensus on the process of acquisition is common. This chapter discusses only a part of the ongoing discourse that is considered to have contributed to shaping the present study.

1.1 The Classic Harvard Studies: Brown, de Villiers and Cazden

Roger Brown's pioneering research on children's semantic and grammatical development (1973) is probably one of the most studied works on child language. The study not only introduced a new research technique of calculating morphemes in utterances, it also reported significant discoveries about children's grammatical development. In his morpheme study, Brown longitudinally investigated fourteen grammatical morphemes and function words in English among three English-speaking children beginning at ages 2;3, 2;3 and 1;6. Children were seen every one or two weeks and their language was recorded and transcribed. Unlike

most of his predecessors, Brown chose to calculate morphemes instead of words per utterances. His justification for choosing Mean Length of Utterance in morphemes (MLU_m) as an index was that it was more representative of children's grammatical knowledge than the length in words (MLU_w). Based on the MLU scores, Brown proposed five stages of grammatical development in which children acquire the target set of morphemes and function words. His significant finding was that children, although having different rates of progress, are surprisingly alike in their order of acquiring those morphemes. Brown noted Spearman's rank-order correlation coefficients of .88, .86 and .87 within each pair of his three participants. This commonality of the order of acquisition was further tested and reinforced by Jill and Peter de Villiers (1978) in their cross-sectional study of 21 English-speaking children between 16 and 40 months. The two ranks (using two methods) created by the de Villiers were highly correlated with each other ($p = .84$) and also with Brown's ($p = .78$ and $p = .87$).

Brown concluded that MLU was a 'fairly good index' of morpheme development. However, he also recommended that age, although a poor indicator alone, added to MLU, improved the predictive power. He explained that "... if two children at the same stage or MLU value are also at the same age they are more alike in their control of our grammatical morphemes than if they are at the same stage and the ages are quite far apart" (p. 273). The de Villiers had a similar finding in their study (1978). Their data too obtained a much higher association between the order of acquisition and MLU ($p = .92$) than the order and age ($p = .68$). An additional finding was that age did not add substantially to the predictive power of MLU alone: when age was partialled out, the 'predictiveness' of MLU decreased only minimally (to $p = .85$).

However, Brown was also aware of the pitfalls of relying too much on the MLU value. He professed that by stage V children's command over language became extremely strong and they were able to make a great range of constructions. Therefore, often what a child at stage V happened to say was dictated by the nature of the interaction, not by the child's knowledge. An index like MLU might prove to be misleading in these contexts. In one of her studies on Brown's data, Cazden (1968) expressed serious doubts about using MLU as a marker of language development. She suggested that a single score like MLU is prone to inaccuracies. Her analyses of the same data revealed that Eve (the youngest child) with the same MLU score as Adam and Sarah had a very different quality of language; Eve's language had more content words. Cazden, therefore, posited that "... the complexity summarized by a certain mean length is not the same in all details for all children" (p. 442). These words of caution have been reiterated by many successive researchers (e.g. Klee & Fitzgerald, 1985; Lahey, Liebergott, Chesnick, Menyuk, & Adams, 1992; Rollins, Snow, & Willett, 1996; Johnston, 2001; Leonard, & Finneran, 2003) with reasonable questioning of the measure for being too susceptible to extralinguistic factors.

Another interesting result forwarded by the de Villiers was the association between the orders of acquisition (OoA), Brown's and de Villiers', and the transformational complexity of the morphemes. Transformational complexity was indicated by the number of changes required to form the sentence. For instance, a *wh*-question in English undergoes a few changes including the movement of the *wh*-word and the auxiliary verb. Their analysis revealed that both Brown's OoA and their OoA were strongly correlated with the structural complexity of the morphemes. In other words, morphemes with more derivational transformations were often found to be acquired later than those with fewer transformations. However, the authors acknowledged that

the order of acquisition of morphemes was not to be defined by structural complexity alone; the semantic complexity of items made a notable contribution to determining when each morpheme was to be acquired. Early on, researchers discovered that while OoA was a useful construct, a child's mastery, or productivity of morphemes was also of importance.

1.2 (Un)Productivity of Language

One of the first ventures to address the issue of productivity in language acquisition was undertaken by Jean Berko through her classic 'wug test' (1958). Her study was designed to determine whether or not young children who used language correctly had mastered the morphological processes that underlie surface forms. Berko deduced that this could not be tested using real words since one would not be able to ascertain whether a correct outcome was to be attributed to the internalisation of the system or to rote-learning with no relation to the other items in the paradigm. She devised a picture test of novel words (verbs, nouns and adjectives) that required children to use English inflections with nonsense items and executed that with preschoolers and first-graders between ages 4 to 7 years. The study revealed that children within this age range had mastered the tested morphological rules and were largely able to apply them to novel items. Only minor quantitative differences were observed between the performance of the preschoolers and that of the first-graders. Berko also noted that children's mastery of the rules was governed by the consistency within the system; children performed best on regular forms and those with fewer variants. For example, morphological forms that have different surface forms like the English regular past marker, i.e. [-d], [-t] and [-id], pose greater challenges than those with a single surface form like the progressive *-ing*. Such

ability of applying rules to a new linguistic environment was also demonstrated by children of age 3 and 4 in other studies in a variety of linguistic domains (e.g. Maratsos, Gudeman, Gerard-Ngo, & DeHart, 1987; Pinker, Lebeaux, & Frost, 1987). However, as Tomasello (2001) pointed out, similar results could not be obtained with children below age 3. Tomasello and Brooks (1998) experimented with 2 and 3 year-olds where children were required to tap their understanding of morphosyntactic processes in English and use novel verbs in transitive contexts after being exposed to those verbs in intransitive contexts. The study found that very few children were successful in the task. This result has been reinforced by some of the successive experimental studies with a similar design (see Tomasello, 2001, 2003 for a review).

Children's early utterances have been widely reported to be selective: children's words are context-specific and grammatical markers used are stem-specific. This phenomenon is characterized by verbs often being used in similar constructions which are determined by how children have heard them in use. This approach to language acquisition is known as the usage-based theory (Tomasello, 2003). Tomasello (1992) reported that during the second year of his daughter's development, in multi-word utterances almost all grammatical markers were verb-specific. Tomasello termed this 'item-based' learning or constructions and this tendency has also been documented by many other researchers studying the acquisition of different languages. Tomasello (2003) explained that the reason behind this selective display of knowledge was due to the fact that some verbs were naturally presented to the child in rich contexts that allowed for multiple and varied instances of those verb, whereas some verbs occurred sparsely resulting in fewer positive evidences for the child to learn from. This phenomenon was supported by findings from other studies too. Periodic sampling and

maternal diary based data of 12 English-speaking children from age one to three years of age revealed that 92% of their earliest multi-word utterances were based on one of their 25 'lexically based patterns', choice of which varied across the children (Lieven, Pine, & Baldwin, 1997). Crosslinguistic findings, too, were in line with Tomasello's proposal. Pizzuto and Caselli (1994) conducted a study with three Italian-speaking children from age 1.5 to 3 years (approximately) on their use of simple, finite, and main verbs and found that 47% of all verbs were used in one form only and another 40% were used in two or three forms. Of the 13% verbs left that occurred in more forms, approximately half were frequent and irregular verbs which, the authors claimed, could only be rote-learnt. A more recent study, also based on Italian-speaking children's spontaneous language samples, obtained similar results (D'Odorico, Fasolo, Cassibba, & Costantini, 2011); 92% of the verbs produced by the youngest children were used in only one or two morphological forms. Converging findings also resulted from a study with six Hebrew-speaking children (Berman & Armon-Lotem, 1995) which found that almost all the first 20 verb forms produced by the children were unanalysed chunks and therefore not learnt systematically. Further crosslinguistic evidence in support of this phenomenon can be found in studies by Noccetti (2003), Bassano (2000), Kilani-Schoch & Dressler (2002), and Uziel-Karl (2001) with Italian-, French-, German- and Hebrew-speaking children respectively.

The two observations, namely young children's inability to demonstrate their knowledge of rules and the use of highly context-dependent words, led to Tomasello's proposal that children's early utterances (before age 3) lacked creativity and resulted from individual experiences. It takes children some time to schematise all their item-learnt knowledge and reach adult-like productivity. Before this stage, their knowledge of the rules is "...simply an

inventory of independent ‘verb island constructions’ that pair a scene of experience and an item-based construction, with no structural relationships among these constructional islands” (2003, p. 121).

1.3 Theoretical Approaches in Child Language Research

While there is a view that children’s early language is largely determined by their individual experiences, there are broadly two other dominant views, i.e. the processing accounts and the linguistic account, that explain the developmental characteristics of children’s language. The proposals to explain the linguistic behaviours of young typically-developing children have often been borrowed from accounts for language impairment since significant overlaps have been found between the performances of children with language impairment and younger typically-developing children. A selective set of proposals relevant to the present study has been discussed in this section which will be further explored in the section on crosslinguistic findings of language acquisition.

1.3.1 Processing constraints account. The issue of processing capacities with regard to language acquisition emanates from the general cognitive processing literature. The human limitation in processing facility has been viewed in terms of time, space or energy (Kail & Salthouse, 1994). Rapid incoming information requires fast processing. Failure to maintain the pace of processing may result in a loss of information or the information will be vulnerable to interference from similar items. From the point of view of space, the storage capacity in human memory is limited and it is not possible to retain every piece of information encountered. Therefore, often the input data are prioritised and some information decays rapidly. Limitation

of energy, similarly, refers to the challenge of completing a task with restricted resources. The constraints are common to every human being; it is the degree of the constraint that makes it relevant to the discussion of language acquisition.

Data from a wide range of studies support the view that limited processing capacity is one of the causes of poor language performance in children. However, disagreement exists about the nature of the limitation: whether the limitation is domain-specific or domain-general. Studies on Specific Language Impairment assuming a global deficit (affecting cognitive skills in general) have noted a slower speed of processing (Miller, Kail, Leonard, & Tomblin, 2001) or limited working memory capacity (Ellis Weismer, Evans, & Hesketh, 1999; Montgomery, 2000a, 2000b) to be responsible for compromised language performance. On the other hand, domain-specific constraints posit a deficit in phonological working memory (Gathercole & Baddeley, 1990) or temporal processing (Tallal et al., 1996).

Restricted processing capacity has been observed both in typically and atypically developing populations. In an early study, Cazden (1968) pointed out that the errors in noun plural marking were more prevalent in longer utterances. Shorter utterances, on the other hand, contained fewer errors. She did not clearly articulate any proposal on processing limitation with regard to this finding but this clearly substantiated the proposal. Also, young Hebrew-speaking children's preference for infinitives and structurally less-specified forms, as reported by Lustigman (2012), indicated a childhood strategy of meeting high linguistic demands through compromised processing skills. Data from children with language impairment also offered similar findings. It was hypothesised and observed that children with language impairment were likely to present with more errors in longer sentences and sentences that

were grammatically or semantically complex (Namazi & Johnston, 1996; Nelson & Kamhi, 1984). Children with language impairment were also found to have restricted processing capacity exhibited through an array of cognitive tasks such as picture description tasks, nonword repetition tasks, fast mapping tasks, lexical monitoring tasks, listening span tasks and inferencing tasks (see Ellis Weismer & Evans, 2002; Leonard, 2014a for a review).

The processing capacity account has an inherent appeal due to the sheer scope of the proposal. However as pointed out (Bishop, 1992; Johnston, 1994), the generality of the idea is also responsible for the intangible nature of the notion. An explanation solely based on the limited processing capacity is not effective enough, especially while assessing children with language difficulty, unless the mechanisms within can be identified.

1.3.2 Surface hypothesis. This hypothesis is a morphological account drawing heavily from the processing capacity proposal. It takes the notion of temporal processing capacity (Tallal et al., 1996) further by suggesting an association between the temporal capacity and the acoustic properties of the morphemes. Leonard and his colleagues have claimed that the acquisition of morphemes is affected by their physical or ‘surface’ properties (Leonard, 1989; Leonard, McGregor, & Allen, 1992; Leonard, Eyer, Bedore, & Grela, 1997). The hypothesis is that morphemes of brief duration are more vulnerable to delayed acquisition than those that are phonetically more salient. The proponents presented, in support of the proposal, the acquisition cases of the 3rd person singular *-s* and the past *-ed* as opposed to the progressive *-ing* and reasoned that the first set of morphemes have brief presence whereas the latter is syllabic and has more phonetic substance which is likely to be the reason why the first two morphemes are acquired later than the *-ing*.

The motivation for this proposal possibly has its origin in Brown's seminal study (1973) on morpheme acquisition where he found the progressive *-ing* to be one of the early emerging morphemes and 3rd person *-s* and regular past *-ed* to be acquired much later. Other researchers of child language too have pointed out in their findings that English morphemes with brief acoustic properties were relatively difficult for children to master (Gleitman, Gleitman, Landau, & Wanner, 1988; Slobin, 1985). According to this suggestion, English auxiliaries and articles were hypothesized to be challenging for children due to the unstressed nature of the physical forms and this is reflected in the child language data too. Further validation for the proposal came from data of children with SLI. The English morphemes that children with SLI had difficulty with were found to be either brief bound morphemes or unstressed function words such as articles, auxiliaries, infinitival *to*, or complementiser *that* (Leonard, 1989; Leonard, Eyer, Bedore, & Grela, 1997).

However, child language data often have displayed differences in the level of accuracy between two English morphemes that appeared to be phonetically 'identical'; both typically and atypically developing children arguably have performed better in the plural *-s* than in the 3rd person singular *-s* (Brown, 1973; Leonard, 2014a). The Surface hypothesis has often been discounted based on this observation. Hsieh, Leonard and Swanson (1999), examined these two morphemes in their study with young typically developing children and found an effect of duration on acquiring these two English grammatical morphemes. They concluded that although the two morphemes appear to sound 'identical', they differ in durational properties. The differences might have been confounded by the fact that the plural marker often occurred in sentence-final position giving it more saliency. However, even when these markers were

compared irrespective of the sentence position, the plural –s was found to be significantly longer than the -3s marker.

This account of language acquisition assumes that the ‘weak’ grammatical morphemes may be perceived by children, but limited processing capacity makes it challenging for children to complete a series of tasks requiring registration of the brief morphemes in their language while more information is still incoming. Children, while analysing the language input, have to hypothesise the grammatical function of the morpheme and place it in the mental organization of the morphological system in addition to primarily paying attention to capture the ‘weak’ language unit. As a result, often children fail to notice relatively brief morphemes in the input. Therefore, these children benefit less from the exposure and require more exposure to finally establish the morpheme in their morphological paradigm (Leonard, 2014a). This results in young children’s frequent inaccuracies with the morpheme and LI children’s resemblance to younger typically developing children.

1.3.3 Morphological richness hypothesis. This proposal emanates from crosslinguistic findings of language acquisition. Comparison between the language performance of children speaking different first languages has revealed a discrepancy in children’s levels of accuracy. Italian-speaking and Greek-speaking typically developing children and German children with SLI have been found to have higher accuracy in various grammatical morphemes than their comparison groups of children speaking English (Caselli, Casadio, & Bates, 1999, on Italian; Stephany, 1997, on Greek; Roberts, 1995, on German). These differences are indicative of the possibility that challenges associated with the acquisition of grammatical domains may be relative and the determining factors may not always lie within the markers themselves.

Children's varying degree of success in language performance in typologically different languages has led to the proposal that children speaking a morphologically rich language will have a relatively higher accuracy in grammatical morphemes than a child speaking a morphologically sparse language (for a definition of morphological richness see Xanthos et al., 2011). Slobin (1985) professed that the richness of morphology of a language makes its young speakers more aware of the grammatical properties of that languages. Therefore, these children are able to identify and master grammatical knowledge much earlier than children speaking a sparse language. Caselli, Casadio, and Bates (1999) suggested that since Italian is a morphologically dense language, Italian-speaking children have to acquire more inflectional morphology than their English-speaking peers. They hypothesised that this would result in either Italian-speaking children taking more time to master the language or they would be comparable to children-speaking other languages only proportionally.

The morphological richness account explains this phenomenon with regard to children's processing capacity. If a language has a rich variety of inflections, then children speaking that language will direct their limited resources towards learning them. On the other hand, for a language like English that relies heavily on word order and has only a few inflections, children will pay attention to the word order at the cost of ignoring the grammatical markers. As a result, children speaking 'dense' languages will have a relatively better control over grammatical markers compared to their counterparts speaking 'sparse' languages (Leonard, 2014a).

1.3.4 Optional Infinitive (OI) and related proposals. Unlike the proposals discussed above, this account of children's acquisition of grammatical morphology is competence-based.

According to this account, children's language development is a reflection of their developing competence and any intermediate language is viewed as problems in the underlying knowledge of the system. English-speaking children's frequent omission of verb-related inflections inspired this proposal. Wexler (1994) stated that young children's particular difficulty with marking verb inflections emanated from their inability to mark finiteness. Based on child language data from some Germanic languages and French, he explained that typically developing children went through a stage in their development where they were unable to mark finiteness in verbs. He added, although children were aware of the grammatical properties of marking finiteness, they frequently missed the markers because they hypothesised that marking finiteness was not obligatory. Wexler identified this as a distinct stage in the linguistic development of children and coined the term 'Optional Infinitive (OI) stage'. One of the additional claims made under this proposal was when children actually produced the markers they were largely accurate and therefore there were no errors of commission among these children. Since the knowledge of the grammatical properties was available to children, the errors simply stemmed from the failure to identify the obligatory nature of finiteness markers. Based on data from some Germanic languages and French, Wexler also claimed that children's errors centred around tense and agreement, whereas non-tense inflections, i.e. person, gender, number markers were accurately produced. Wexler stated that in the absence of the understanding of marking finiteness obligatorily, children often produced nonfinite forms of verbs, which were commonly observed to be the infinitival forms.

An extension of this proposal was drawn by Rice, Wexler and Cleave (1995) to explain a similar trend in children with language impairment. They proposed that all the claims made for

the OI stage would hold for children with LI too. The distinct claim for the LI group was that these children would have a protracted period in the OI stage, namely the stage of Extended Optional Infinitive, where they would inconsistently use the finiteness markers. The length of the period, as noted by them, was undefined with the possibility of some children never outgrowing that stage.

Since verb morphology was widely reported to be an area with notable developmental issues for both typically and atypically developing children, and the OI/EOI proposals addressed this with convincing evidence from English, German, Swedish, Dutch and French (English, Wexler, 1994; German, Poeppel & Wexler, 1993; Swedish, Platzack, 1990; Dutch, Haegeman, 1995; French, Pierce, 1992), the claims appeared to be very promising. However, the proposals were unable to explain child language data from other languages like Italian and Hebrew. A great deal of research on Italian and Hebrew data identified very rare use of infinitival forms in children's errors (Caselli, Leonard, Volterra, & Campagnoli, 1993; Guasti, 1993; Bortolini & Leonard, 1996; Leonard, Caselli, Bortolini, McGregor, & Sabbadini, 1992; Leonard & Dromi, 1994). Instead their errors were finite non-target forms. Wexler (1998) identified these patterns to be specific to null-subject languages and revised the OI/EOI proposal. His revised proposal, (Extended) Unique Checking Constraint (UCC/EUCC) stated with reference to the feature-checking framework that in null-subject languages checking was required only for tense, unlike English that required checking for both tense and agreement. Young children or children with language impairment, as Wexler suggested, had the limitation of being able to check at only one point. Therefore, these children did not have any apparent difficulty in marking finiteness, whereas young speakers of non-null-subject languages manifested errors regarding finiteness

due to the unique checking constraint common to all children. Similarly as with the EOI account, the Extended Unique Checking Constraints claimed that young typically developing children would eventually outgrow this stage of being able to 'check' at one point only, whereas the stage would be longer and undefined for children with language impairment.

1.4 Crosslinguistic Findings on Acquisition of Inflections

In order to understand the universal principles of language acquisition, examination of child data from a wide variety of languages is required. Languages of the world are typologically diverse in many ways that contribute to the development of language for children. Some languages that are morphologically elaborate mark verbs for tense, aspect, number, person and gender while others only mark for one or two of these. Some languages obligatorily realise subjects and objects in sentences while others project them optionally. Crosslinguistic findings of language acquisition reveal distinct linguistic trends that reflect the underlying principles of the language studied. As noted by Slobin (1985), the virtue of crosslinguistic studies has been apparent even in the early works on child language. Because developmental patterns manifest differently in different languages, profiles from various languages are required to establish a well-grounded notion of child language development. Therefore, the purposes of crosslinguistic evidence is to discover a picture of child language development "... in which we can see why patterns of acquisition of specific properties vary from language to language, while they are determined by common principles of a higher order" (Slobin, 1985, p. 5).

A recent study by Xanthos et al (2011) revealed the significance of typological differences on language acquisition. The study included nine children speaking nine

typologically different languages that were at different points on a scale from sparse to rich morphology. The collection of languages had both agglutinative (Turkish, Finnish and Yucatec Maya) and fusional (Russian) languages. Beginning at different points, the children were seen until they were three years old. The correlation between the language type (measured from child-directed speech) and children's speed of development in verb inflections revealed a highly strong association ($p = .93$, $p < .001$). Children exposed to languages that had rich and complex morphology (measured by mean size of paradigm), were found to acquire the verb inflections faster than the other children. The results were evidence that language typology regulated children's language development in significant ways which reiterated the importance of crosslinguistic findings. The section below compiles findings from acquisition studies in some of the typologically different languages.

German is a non-null-subject language that is often categorized as a fusional language. As found in fusional languages, individual German inflections often represent several morphemes. For example, the morpheme /-te/ in *sag-te* ([I] say) stands for first or third person singular present indicative active features (Bittner, 2003). One of the findings on German acquisition came from an interpretation of the Simone corpus in German (Miller, 1976) by Clahsen and Penke (1992) who pointed out that children's errors with German agreement markers were largely omissions. During the ages between 1;7 to 2;8 years, the child was found to have 81.5% and 83% accuracy in second person singular and third person singular markers respectively. However, the child was appropriate almost every time she produced an agreement marker. In the acquisition of tense and aspect markers, German-speaking children demonstrated the properties of an Optional Infinitive stage (Poepfel & Wexler, 1993; Behrens,

1993). Children during an early stage of development were found to produce a large number of infinite forms when finite markers were obligatory in the utterances. An Optional Infinitive stage entailed children's high accuracy when the finiteness markers were actually produced in utterances. Behrens (1993) worked on seven German corpora to examine whether children's tense markers used are appropriate. She reported that children's utterances contained many nonfinite root verb forms in addition to finite verb forms. Behrens' findings were compatible with previous suggestions in that these children's finite forms were correctly used according to the adult German almost always. Recent crosslinguistic research (Phillips, 2010) on the acquisition of verb inflections presented an adaptation of a part of Behrens' data that encompassed the findings discussed above (Table 1.1).

Table 1.1

Simone's Usage of Tense Morphology

	Number of Uses	Minimum % Target-like
Present	377	97%
'Perfekt'	293	99%
Root Infinitive	355	n/a

Note. From Phillips, 2010.

The root-infinitive stage lasted for different durations in different children, in different languages. Phillips (2010) suggested that the decline in the root-infinitive could possibly be explained by a gain in children's knowledge. Behrens (1993) reported a specific time period with reference to the Simone corpus (Miller, 1976) and suggested that the inappropriate use of the root-infinitive for finite forms completely faded away around age three.

Bittner (2003) identified some early features of verb morphological development from a longitudinal study on two German-speaking children from 1;6 to 2;2 years. Bittner's data showed a distinct difference between children's tense and non-tense markers. On an average, non-tense markers vastly outnumbered tense markers. All the temporal markers produced marked present tense and indicative mood with the exception of a few past participle forms. For both children, first person singular present and third person singular present forms were the ones to be acquired first. Past tense markers emerged later- around age two for both children.

Although sometimes identified as a weakly inflected language (see Xanthos et al., 2011), French verbs are marked for person, number, tense, aspect and mood. Kilani-Schoch (2003) followed two French-speaking children over a period of about eight months till they were about 2;0 years of age. During this period these two children showed remarkable development in verb morphology. At the initial stage they were found to have only 8% (approximately) utterances containing verbs which increased to 29% and 39% at the end of the study. As established from this dataset, some of the earliest conjugated verb forms were the present indicative singular, the imperative and the infinitive (root form in French) forms. Together the present simple singular and the infinitive forms constituted about 73% and 68% of the conjugated verb forms. However, whether children preferred an inflected form (Present indicative singular) or an infinitival root form at the premorphology stage (marked by the end of 1;7 and 1;11 months) was not clear from this set of data. As expected, the child identified to have a faster rate was the one to produce the inflected form instead of the root infinitive. An overall error analysis revealed that root-infinitives were the most common substitution found in these children.

Importantly, in French root-infinitival forms as deviant forms can occur due to omission of an auxiliary or modal verb or due to substitution of a finite form. The use of infinitival forms during the early stage of acquisition is also documented in other research (Clark, 1985) based on the available database for French. As noted by Clark, the first verb inflection appeared at two-word stage and the first marker typically expressed perfectivity.

The case of Italian child data brought in major revelations in the literature. One of its pivotal findings was children's early use of finite forms and use of finite forms even in errors. Based on earlier research done mostly in Germanic languages, Wexler (1994) proposed an Optional Infinitive stage for children where they failed to understand the obligatory nature of finiteness markers resulting in children's ubiquitous production of root-infinitive as substitute for finite forms. Italian is a fusional null-subject language. Italian studies (Caselli, Leonard, Volterra, & Campagnoli, 1993; Guasti, 1993) revealed that an Optional Infinitive stage was not common for all languages; Italian-speaking children exhibited very rare use of infinitives. Another finding on Italian data came from Pizzuto and Caselli (1992) who discovered children's relative ease with producing the third person singular inflections. However, third person plural had a much lower accuracy (Caselli, Leonard, Volterra, & Campagnoli, 1993). In a later study, Leonard, Caselli and Devescovi (2002) investigated whether the third person singular is the unmarked default form in Italian that children used as a preferred substitute for unavailable verb inflections. Sixty children between age 2;5 to 7;1 participated in production probes and in spontaneous play sessions. The study found a unidirectional substitution of third person forms often replacing the first person forms but not vice versa. Also, singular inflections showed a similar pattern of replacing plural forms. The researchers concluded that probably there was no

default form in Italian; rather, the errors were mostly 'near-misses', i.e. children were found to miss the target forms just by one feature. They were more likely to use a third person singular form when the target form was third person plural or first person singular. But that form was not used when the target form was first person plural. Children's internal hierarchy within grammatical morphology depending on the structural or semantic complexity of the form was observed in other studies too. Noccetti's study with an Italian-speaking child showed that children's emergence of verb inflections were determined by 'naturalness principles' which reflected in children learning the least marked forms like present tense, second person imperative, singular, and first/ third person forms in Italian (2003). A later study based on 45 Italian-speaking children between two to three years of age also reported second person present imperative, and first and third person present indicative forms to be some of the earliest achievements in Italian-speaking children's grammatical morphology (D'Odorico, Fasolo, Cassibba, & Costantini, 2011).

Italian-speaking children's utterances did not show the presence of an Optional Infinitive stage, but the utterances were not 'error-free' like the Turkish data; they missed the target form by mostly one feature. This phenomenon was explained by Pinker (1984) where he stated that children learning fusional languages would have more difficulty learning the inflectional paradigm because in these languages each inflection was specific to a certain person, number, gender feature. Therefore, children speaking these languages were likely to have limited exposure to each inflection which would result in late paradigm formation compared with agglutinative languages.

The case of Turkish is very significant for language acquisition literature due to its exceptionally heavy inflectional morphology. Turkish, an agglutinative language, has a set of inflections each representing a single morphological feature and these inflections combine to create different morphological conjugations. For example, the verb *al* (to take) attaching the progressive marker *-iyor* refers to '[he/she/it] is taking' (*al-iyor*). The plural marker *-lar* added to the previous combination stands for '[they] are taking' (*al-iyor-lar*) (Aksu-Koc & Slobin, 1985). Turkish studies provide a platform for research on Bangla. It provides comparable areas for analysis due to having shared linguistic properties like the same word order, flexibility within a given order, agglutinative features, transparency of the inflections and null-subjectness. In a comment on Turkish-speaking children's language acquisition, Aksu-Koc and Slobin (1985) stated that early utterances of these children were short and simple but almost always grammatical. Unlike early utterances of children in many languages studied, their utterances were not telegraphic and they contained grammatical markers that were correctly produced. Aksu (1978) found evidence for a hierarchy in verb inflections marking aspectual information that was regulated by the cognitive complexity of the concept. One of the past tense markers and the present progressive marker were observed in children's utterances by 21 months of age while another past tense marker emerged about three months later (Aksu-Koc & Slobin, 1985). Aksu-Koc and Slobin also noted evidence of productivity in children's use of verb inflections as early as 15 months of age. A unique finding from the Turkish data was that the child language data were largely error-free. The researchers in their study identified 12 possible reasons for the absence of errors, some of which are: the inflections were postposed, syllabic and stressed, increasing the salience of the markers; inflections were obligatory, creating

consistent positive evidence for children; inflections were transparent and almost all of them had distinct phonetic forms. In their longitudinal study, Aksu-Koc and Ketrez (2003) reported the progress of one Turkish child's use of verbs and related grammatical morphology from age 1;5 to age 1;9. They noted a sharp increase in the child's use of verbs at a very early age. Only 2% of the child's utterances contained verbs in stage I (1;3.3 - 1;5.9), increasing to 63% in stage II (1;5.28 - 1;9.19). By the end of stage II, he had 80 verbs in his vocabulary and was able to use six verb inflections requiring four inflectional contrasts productively with more than half of the verbs. Unlike most of the Turkish studies, this study reported some omissions in the child's use of verb inflections. However, the omission diminished early; by the end of stage II (1;9 years) the child was observed to have no omissions in his utterances. The discrepancy in the finding between this study and most other Turkish studies, i. e. the presence of omission in Turkish child data, might have resulted from the fact that this study followed the child from a very early age. Had he been seen from age two, there probably would have been no omissions.

Hebrew, a root-and-pattern language, showed distinct developmental characteristics. The root in Hebrew contains the essential meaning whereas the patterns modify the root by adding information about causation or reciprocity. For instance, the root *l-v-sh* (to wear) becomes the verb *lovesh* expressing the simple transitive form of *to wear*, *malbish* meaning dressing someone and *miltabesh* meaning dressing oneself (Leonard, 2014a). These forms are further inflected to mark tense, number, gender and person. Hebrew-speaking children's growth in morphological knowledge was closely examined by Armon-Lotem and Berman (2003). Six children's longitudinal samples or diary data from age 1;2 to 2;1 years were included in this study. An important finding of this study was regarding children's overwhelming use of

‘stripped forms’. As the authors stated, stripped forms were unclear stem-like forms that could be vaguely used for different inflected forms. The participants in this study were found to make use of this morphologically unspecified form to a great extent; a breakdown of the 120 verb forms revealed that 45% of the forms produced were stripped forms. These forms were typically the second, stem-final syllable and were stressed, therefore phonetically more salient. These children also showed use of other tense-related markers. 30% of the 120 verb forms marked either present, past or future tense. However, the use of tense morphology was extensively used to mark aspect rather than tense. The past tense forms typically stood to mark perfectivity and the present tense forms referred to either progression or states. Interestingly, the use of infinitive was as low as 6%. However, Lustigman (2012) reported a much higher rate of infinitive use in the language of a child from ages 1;8 to 2;0 years (significantly older than the previous group). During this period, this child’s use of the infinitive forms amounted to 74% of all the prefixes used. As explained by the author, infinitives in Hebrew too were less demanding than the morphologically specified forms that enabled children to indicate various non-reportive communicative acts. In addition to the ‘nonspecified bare forms’ and infinitives, Lustigman (2012) noted children’s use of underspecified *benoni* forms before mastery. These forms stood for present tense and marked only for number and gender, not for person. Whether nonspecified or under specified forms, these are less evolved, non-target forms that represent children’s trajectory through intermediate phases. They reflect children’s limited capacity and are possibly interpreted within the processing constraints account of language acquisition.

Children's use of agreement markers in Hebrew showed evidence of item-based learning where they produced the gender and number markers in a formulaic fashion (Armon-Lotem & Berman, 2003). Irrespective of the subject, children were initially found to use feminine inflections which later evolved to create the contrast of masculine and feminine markers with the same verbs. Armon-Lotem and Berman (2003) reported that the contrasts regarding person markers were the last verb inflections to be acquired by Hebrew-speaking children. The authors also presented a possible explanation why gender and number markers preceded person marker in child Hebrew. They stated that gender and number inflections were dominant in Hebrew and they applied to a variety of word classes like nouns, verbs, adjectives and so on, while person markers were required only for verbs, and only in two tense forms.

Studies on Cantonese make a significant contribution to the language acquisition literature. Unlike the languages discussed above, Cantonese is an isolating language with an exceptionally limited set of inflections. Verbs in Cantonese do not mark for number, person, gender or for tense. Temporal meaning is often expressed only through a set of aspect markers (Matthews & Yip, 1994). Due to the sporadic instances of inflections, the case of Cantonese is interesting and it is expected to have significant bearings on what we know about language acquisition. A longitudinal study (Leung, 1995) on a child seen from 21 months to 45 months of age revealed the child's relative ease of marking one of the two perfective markers, *zo2*, an aspect marker used to express completed action, the effect of which is still present. At the beginning of the study (21 months) the child was found to be using this marker productively with nine different verb stems. This was followed by the two imperfective aspect markers: *zyu6*- marker for a continuous activity or a state (24 months) and *gan2*- for ongoing activity (39

months). The same order of acquisition was obtained by Lee, Wong, and Wong (1996) from a study with two Cantonese-speaking children. As evident from these studies, the other imperfective marker, *gwo3*, was clearly the most challenging of the set since it did not emerge in any of the language samples until the end. The Cantonese data suggested that children with less facility, i.e. the young TD children, were likely to be limited in their use of grammatical morphology in some fashion. Developmental trends in morphology can be identified even when the language offers a small set of grammatical inflections.

1.5 Findings from Bangla and Neighbours

The fact that there has been very little research on the acquisition of Bangla or other languages spoken in the adjacent regions has motivated the need for the current study. Languages of these regions often share similar properties with Bangla which makes them important references for studies on Bangla. Studies on the acquisition of Bangla verb morphology are few in number. Recently Chakraborty and Leonard published a paper on the development of verb morphology among Bangla-speaking children (2012). They presented data from 37 monolingual Bangla-speaking children between age 1;6 to 4;0 years. Children were examined on first, second and third person present progressive and past progressive forms using six elicitation tasks. They employed a question-answer format to elicit the first and the second person present and past responses, whereas the third person responses were elicited using sentence completion prompts as well as questions. The results revealed an overall high accuracy of the inflections (Table 1.2). The authors attributed this finding to the relatively transparent nature of the composition of Bangla verb morphology. They also suggested that the

fact that Bangla verbs agreed with the subject only in person might have contributed to the high accuracy rates. Further, they found that second person responses were significantly less accurate than the other two forms in both present and past contexts. This was not very surprising, according to Chakraborty and Leonard, given the fact that similar patterns in performance were reported for French (Bassano, Maillochon, Klampfer, & Dressler, 2001) and Greek (Stephany, 1997). Interestingly, no difference was observed between children's accuracy in the present and the past progressive forms. Their error analysis of the data revealed that in the present progressive tasks, of the tense-aspect-person errors, only 2.2% of the errors were incorrect aspect markers and only 3.52% of the errors were incorrect tense markers; the rest were incorrect person markers. In the past progressive tasks, of the tense-aspect-person errors, tense and aspect inaccuracies constituted only 9.69% and 5.4% of the errors respectively indicating a large 75.54% of errors being inappropriate person markers. They concluded that person markers in Bangla were more difficult for children to learn than the tense and aspect markers. However, they also noted that the progressive aspect markers in that study might have been less challenging than otherwise because all the verbs employed in that study were activity verbs, and the acquisition of grammatical aspects has been widely reported to be influenced by the interaction between lexical and grammatical aspect (Aksu-Koc, 1988; Antinucci & Miller, 1976; Bloom, Lifter, & Hafitz, 1980; Bronckart & Sinclair, 1973; Li & Bowerman, 1998; Stephany, 1997).

Table 1.2

Accuracy in the Bengali Verb Inflections across the Age Range

	Present			Past		
	1 st	2 nd	3 rd	1 st	2 nd	3 rd
Mean	93.26	71.16	95.21	89.42	70.21	84.47
SD	5.97	23.43	7.14	8.44	31.03	15.98

Note. From Chakraborty and Leonard, 2012.

One of the earliest studies of the acquisition of verb morphology among the neighbours of Bangla was conducted on Tamil child language by Raghavendra and Leonard (1989). The study investigated the acquisition of verb inflections in three children between age 2;2 and 2;7. Spontaneous language samples were collected and responses were elicited on eight verbs in present, past and future tense. Both sets of data were combined to calculate the accuracy of the verb inflections. The findings revealed an 'almost error-free acquisition'. The authors attributed this finding to the agglutinative properties of Tamil and to the fact that the inflections in Tamil were often syllabic and therefore perceptually salient. Ramadoss and Amritavalli (2007) also found a very high accuracy for Tamil negation from longitudinal data of two children from 18 to 30 months of their ages. Sarma (1999)'s investigation of verbal inflections made a similar suggestion about children's accuracy. Sarma concluded that verbal agreement was used correctly even by children below age 2. In addition, an extensive use of imperative forms that were identical to bare forms was reported for the children of this age. In contrast, very limited use of the finite verb forms was observed. Raghavendra and Leonard (1989) too reported some use of the bare form by the youngest child in their study (2;2) as substitutes for the finite forms.

Lakshmanan (2006) investigated longitudinally the use of verb inflections among five Tamil-speaking children below age three from their spontaneous language samples. She reported substantial inaccuracies in the verb inflections for the two youngest children (reported from age 1;9 to 2;0 years). Data of these children also revealed an extensive use of nonfinite verb forms where finite forms were warranted. Lakshmanan proposed that the omission of the verbal inflections was likely to be due to performance constraints of the young children. However, she reported that these children exhibited knowledge of verbal inflections by distinguishing between tense-person markers. Children were found to have used the appropriate tense-person marker even when the responses were simplified versions of the target forms. Lakshmanan concluded that "...even prior to the age of 2 years, the Tamil-speaking child does possess knowledge of the grammatical categories and features associated with verbal inflection, which characterise the adult grammar, although these are not readily apparent in a simple fashion from the child's surface production" (p. 200). Discussing the experimental design, she suggested that relying solely on language samples was problematic for drawing conclusion about children's acquisition and there was a need for examining the forms through experimental tasks.

Studies across languages have documented significant patterns of development and established a compelling need for findings from languages that differ in important ways in order to arrive at the underlying commonalities in children's language acquisition. In some languages, children have shown exceptional success in certain markers which in other languages have been acquired later. Errors have been found to manifest in distinct patterns; in some languages children resorted to bare forms, while in others they preferred non-target finite forms.

Children's rate of progress has also varied greatly within and across languages. Although a general explanation for language development is far from being established, there has been considerable agreement that children's acquisition patterns are largely regulated by the type of language they acquire. Two children acquiring typologically similar languages are expected to be more alike in their developmental characteristics than those learning languages belonging to different language families. Therefore, crosslinguistic studies on language acquisition are recognised to be highly enlightening and studying child data crosslinguistically is considered essential with the view to understand the cognitive task of language acquisition more fully.

Chapter Two

On Specific Language Impairment

2.1 Language Impairment

Mastering a language at an amazing pace is typical of young children. However, not all children have a smooth journey into the vast realm of language. One of the groups experiencing significant difficulty and very slow progress suffers from a developmental language disorder termed Specific Language Impairment (SLI). This group is unique because they exhibit a restricted understanding of language and expressive language deficits, and performance difficulties without any evidence of hearing loss, neurological damage, significant cognitive disadvantage and motor disabilities. Often this difficulty is termed 'developmental aphasia', 'developmental dysphasia' (Tallal & Piercy, 1973a), 'delayed language' etc, although the labels are not synonymous. Therefore, Specific Language Impairment (SLI) is the preferred and the recognized term in the literature.

This chapter outlines the linguistic characteristics of children with SLI, the criteria for categorisation of SLI, the subtypes of impairment, prevalence and etiology of the condition, and the main theoretical accounts for the impairment.

2.2 Nature of Difficulty

Some of the hallmarks of SLI are delayed emergence of first words and word combinations, remarkably slow development and significant difficulty in specific areas of language. Trauner, Wulfeck, Tallal and Hessenlink (1995) conducted a retrospective study of 71

children with SLI that confirmed a striking delay in the use of first words among children with SLI with the onset times for the typically developing children and children with SLI being 11 months and 23 months respectively. The same study also revealed that the first word combination emerged as late as at 37 months for the SLI group, whereas for the typically developing children it was only 17 months.

The linguistic domain that shows the most obvious difference between children with SLI and their age-matched peers is that of grammatical morphology. Children with SLI generally perform very poorly in this area compared to their lexical abilities, although lexical ability too is below age level. For example, in English 3rd person singular *-s* (*She sings well*), past regular *-ed* (*We walked a mile*) and articles (*The boy is painting*) were found to be particularly challenging for children with SLI (e.g. Cleave & Rice, 1997; Gopnik & Crago, 1991; Johnston & Kamhi, 1984; Loeb & Leonard, 1991). The following utterances are typical of an English-speaking SLI child (Leonard et al. 1992):

1. Adult: The woman is washing dishes and...
Child: Boy is painting. (The man is painting)
2. Adult: She's combing her hair. What did she do?
Child: Comb hair. (combed her hair)

Studies conducted on languages other than English also revealed a disability in grammatical morphology. In Romance languages like Italian, Spanish and French clitic pronouns were found to be one of the primary locus of difficulty (Bedore & Leonard, 2005; Bortolini, Caselli, & Leonard, 1997; Paradis, Crago & Genesee, 2003). In addition, noun morphology was

observed to be challenging in some languages like Spanish, Hebrew, German, Hungarian, Turkish and Japanese. Within the morphological systems of noun phrase in different languages, variation in performance was noted between noun pluralisation and noun case marking. Spanish-speaking SLI children showed poor performance in pluralisation, whereas German, Turkish, Hebrew and Japanese data identified case marking to be particularly difficult for children with SLI (Leonard, 2014a). On the other hand, data from German (Roberts & Leonard, 1997), Hebrew (Dromi et al, 1999), Finnish (Kunnari et al., 2011), Swedish (Leonard, Nettelbladt, & Deevy, 2004), Hungarian (Lukacs, Leonard, Kas, & Pleh, 2009), Arabic (Abdalla & Crago, 2008) and Cantonese (Fletcher, Leonard, Stokes, & Wong, 2005; 2009) showed difficulty in verb morphology. Unlike children speaking morphologically rich languages like Italian and Spanish, the English-speaking children with SLI were found to have difficulty in marking tense and agreement, which often resulted in omission of those markers (Rice, 2003). But for the affected children speaking Dutch, German and Swedish the difficulty appeared to be errors of substituting the target verb forms with infinitive forms (Hansson et al., 2000). Data gathered from an earlier study by Rice (1998) posited that tense-related markers solely could identify the children with SLI with striking sensitivity and specificity, and suggested that tense was the locus of difficulty for these children. However, this claim was revised by Leonard (2000) with evidence from crosslinguistic studies, and he concluded that it was the areas involving agreement or tense (or both) that posed a challenge for the SLI population. Cross-linguistic studies are discussed in detail later in this chapter.

It must be noted that poor performance in some domains does not indicate an absence of the markers; rather the difference is one of degree. In other words, children with SLI do not

have consistently erroneous uses of the particular markers. It is their inconsistency of use that makes them a distinct group. Leonard et al. (1997) reported that in spite of having an accuracy level notably below that of a group of children matched on Mean Length of Utterance (MLU), children with SLI speaking English showed evidence of productivity in their language performance. Finally, the errors produced by children with SLI are not bizarre. In fact, they produce patterns often found among younger typically-developing children. But while the younger group of TD children outgrows the stage of producing errors following their developmental schedules, children with SLI continue to produce errors for a protracted period and very often they never come out of this stage completely.

2.3 Criteria Marking SLI

For the purpose of identification of SLI and the creation of effective interventions, some diagnostic criteria have been recognised. However, the preciseness of these criteria has often been questioned and research is ongoing to make refinements in the criteria.

The primary problem for children with SLI is language performance. These children show a noticeably different profile from their age-matched peers, therefore a measure of their linguistic abilities is the most important marker of identification. A common convention is to evaluate their performance through language tests, and according to the SLI Consortium (2004) a composite score of at least 1.5 standard deviations (SD) below the average for their age marks the SLI population (measured from Clinical Evaluation of Language Fundamentals (CELF-R) (Semel, Wiig, & Secord, 1992). However, there is no agreement on the decision about the score. In a large epidemiological study, Tomblin, Records, and Zhang (1996) diagnosed children to

have SLI if they performed at least 1.25 SDs below the average in any two of the five language scores (vocabulary, grammar, narrative, and in receptive and expressive modalities). On the other hand, the World Health Organisation (International Classification of Diseases, ICD-10, 1993) set a score of 2 SDs below the average for the SLI population.

Another tool for gathering responses of the population is collecting spontaneous speech samples. The linguistic abilities are then expressed in mean length of utterance (MLU), and compared against the normative data. However, speech samples are usually not used as the sole measure of language due to the lack of control over the context.

Along with language scores, a non-verbal IQ test is conducted with the population almost always. The test requires that a child scores above a standard score 85 to be included in the possible population. Any child scoring below that would implicate a cognitive component which would exclude him/her from a diagnosis of SLI. It is the discrepancy between the language and the non-verbal IQ scores supplemented by some exclusionary criteria that identifies the SLI population.

But the use of a non-verbal IQ criterion is debatable. A sizable group of children scoring slightly above or below this score were also found to have similar linguistic profiles (Tomblin & Zhang, 1999). Therefore, a National Institutes of Health (USA) panel of linguistic researchers suggested that children with lower non-verbal IQ scores should also be included for study until more convincing evidence of distinctions was found (Tager-Flusberg & Cooper, 1999), and in recent years this led many researchers to examine the difference in performance by the children with SLI (IQ above 85) and those with non-specific language impairment (NLI) (IQ below 85) more closely (e.g. Leonard, Miller, & Finneran, 2009).

The definition of SLI rules out any child with a neurological condition. Therefore, if a child has suffered from a brain injury, cerebral palsy, focal brain lesion or seizure disorders, she is not included in the population.

Another exclusionary criterion for the SLI group is that hearing abilities are within the normal range. Therefore, typically a hearing screening is done with the population and a child is included in the category of SLI only if she meets the conventional hearing range, unless any other test score rules out a diagnosis of SLI.

In addition to the above measures, the target population is sometimes tested for Otitis media with effusion (OME), a health condition caused due to accumulation of fluids in the middle ear that often results in 'a mild and fluctuating hearing loss' (Leonard, 2014a, p. 21). Although the evidence of OME affecting the language performance of children is sparse, some researchers prefer to inquire about the children's history with OME, and children with episodes of OME within the previous 12 months are excluded from the study (cf. Loeb & Leonard, 1991; Paradise et al., 2000).

Other than these criteria, children are also checked for any oral motor abnormalities in terms of structures and functions that may cause problems with normal language production. Finally, the target population is observed for their social interaction to rule out any possibility of wrongly including a child with autism or 'pervasive developmental disorder not otherwise specified' (PDDNOS) (American Psychiatric Association, 1994).

It must also be acknowledged that this set of criteria is only suggestive and not prescriptive. There are children who have marked problems with language, yet they did not meet these conditions fully. Telling evidence came from a study by Stark and Tallal (1981)

indicating that only 39 of the 132 children referred by clinicians met the criteria for SLI. This confusion was compounded by the fact that even within the group meeting the conditions, there was a diverse set of performance profiles which suggested that the SLI population was not homogenous.

2.4 Subtypes of SLI

The criteria listed above, unfortunately, do not lead to a uniform group. Children with language disorders differ in their linguistic profiles. For instance, a child may have very poor understanding of the language spoken to her, whereas another child may have restricted language production with relatively spared comprehension. A very common distinction is made between the difficulties with comprehension and production. However, this broad categorisation is no longer favoured because this distinction is 'more a matter of degree than a sharp divide' (Bishop, 1997, p. 35). Rapin and Allen (1987) proposed an effective model of classification system based on clinical findings. This system identified the linguistic domains wherein the problem concentrated. According to this model, some of the subtypes are constituted of children who had problems understanding verbal input with very limited production (verbal auditory agnosia), who had satisfactory comprehension but limited speech (verbal dyspraxia), who produced short and ungrammatical utterances with omission of grammatical inflections (phonologic-syntactic deficit syndrome), and who produced well-formed but pragmatically faulty sentences that often echoed the language heard in the environment (semantic-pragmatic deficit syndrome).

Conti-Ramsden, Crutchley and Botting (1997) presented a relatively recent classification which was based on cluster analysis. This technique revealed five different profiles of language impairment. The subgroups consisted of (1) children who had severe receptive and expressive impairment with very poor performance on all language tests, (2) children with difficulties in word reading, grammar and narrative skills with relatively good phonological and vocabulary skills, (3) children with expressive-phonological impairment but satisfactory expressive vocabulary and comprehension, (4) children with phonological deficits with poor expressive vocabulary, and (5) children with adequate performance in all the above domains but who were reported to have problems with the social use of language.

These models are surely a breakthrough from the rudimentary divisions made earlier. However, these models are not mutually exclusive and it is possible to find the basic receptive-expressive categorisation covertly present in others.

The issue is a lack of consensus among practitioners on these distinctions. Evidence suggested that children often moved from one profile to another with age (Bishop & Edmundson, 1987a; Conti-Ramsden & Botting, 1999). Therefore, what seemed to be subgroups in a particular point of time might actually be two stages on a developmental line of the same disorder. Moreover, with adequate research evidence some of the subgroups are now recognised as distinct language disorders. For example, the fifth group in the classification by Conti-Ramsden et al (1997) does not constitute a subtype of SLI anymore; rather the disability is now considered to be a distinct language disorder named Pragmatic Language Impairment (PLI). Therefore, there are suggestions that these subgroups might be distinct language

disorders. However, extensive research into the underlying cognitive processes is required before these claims can be substantiated (Bishop, 1997).

2.5 SLI and Associated Disorders

Recently the specificity of SLI has begun to be questioned. The boundaries of SLI are not distinct and often overlap with other disorders. It is a common suggestion in the literature that the children diagnosed with SLI often display reading disability at a later stage (Catts, Fey, Tomblin, & Zhang, 2002; Snowling & Hulme, 2005). Because the two groups exhibit problems in similar areas (e.g. phonological processing), the impediments experienced in speech and language in the pre-school years often intensify in the school years by causing challenges in reading. Some researchers advocate that SLI and dyslexia are two points on a continuum (Catts, 1991; Kamhi & Catts, 1986), whereas others consider the relationship to be more complex and suggest that 'two dimensions of impairment are needed to conceptualise the relationship between these disorders and to capture phenotypic features that are important for identifying neurobiologically and etiologically coherent subgroups' (Bishop & Snowling, 2004, p. 858). Besides, specifically language-impaired children sometimes also display poor motor coordination (Bishop & Edmundson, 1987b), and suffer from an attention deficit disorder (Beitchman et al, 1986). Finally, substantial research gathered evidence that suggested that the impairment of the children with SLI did not concentrate on language only and these children exhibited a more general cognitive deficit (Johnston & Ellis Weismer, 1983; Miller, Kail, Leonard, Tomblin, 2001; Sininger, Klatzky, & Kirchner, 1989). These research outcomes

questioned the nature and the specificity of SLI, and many researchers now prefer the term 'language impairment' instead.

2.6 Prevalence and Persistence

The prevalence studies of SLI have yielded somewhat varying results, which is likely to be due to the difference in the selection criteria and the research tools (cf. Law, Boyle, Harris, Harkness, & Nye, 2000). It is also very likely to be motivated by the fact that SLI is a dynamic condition with the affected population changing their linguistic profiles and sometimes resolving the difficulties (Bishop & Edmundson, 1987a; Tomblin et al., 1997). The American Psychiatric Associations' DSM- IV (1994) revealed that 5% of the general population was affected by SLI when only production deficits were considered, whereas the number went down to 3% when both comprehension and production were assessed. A later study by Johnson et al. (1999) discovered a sizeable prevalence rate of 10% among the 5 year olds. However, cross-matching with the clinical practitioners' ratings identified a smaller population of 6.7%.

The most widely documented study of prevalence was done by Tomblin et al. (1997). With a SD criterion of -1.25 on at least two standard tests, the study was conducted with 6000 children of age 5 in the following areas: vocabulary, grammar, narrative, comprehension and production. This diagnosed 7.4% of the population with good sensitivity and excellent specificity.

The prevalence studies also discovered a regularity of association between SLI and the sex of children. According to Robinson (1991), SLI was two to three times more prevalent among boys than girls. However, the Tomblin et al. study (1997) revealed a moderate ratio of

1.33:1 boys to girls. A study on reading disability (Shaywitz et al., 1990) gathered an even rate of prevalence among boys and girls that questioned the association between the child's sex and SLI. Reading impaired boys often tended to exhibit other behavioural disorders due to which they might be referred for clinical intervention more often. Although studies have obtained results in favour of female children, whether the biological determination of sex has any resulting significance for SLI is an issue yet to be confirmed.

A sizeable body of research was conducted in exploration of the long-term outcomes of SLI among children. Findings suggested that the affected population made progress and some outgrew the stage of disordered language. However, 50%- 90% of the identified population continued to have difficulties and many began to display reading disabilities (Bird, Bishop, & Freeman, 1995; Catts, Fey, Tomblin, & Zhang, 2002). Bishop and Edmundson (1987a) identified some factors that might predict the gains of the SLI population over time. Their investigation showed that 37% of four-year old children ceased to have any more difficulty by the age 5;6 and interestingly, children with higher IQ were more likely to outgrow the disability. However, the nature of disability often tends to take a subtle shape among the "resolved" group (Bishop & Adams, 1990; Leonard, 2014a). A portion of the same group was studied by Stothard et al (1998) when they were 15-16 years old. The study showed a depressed outcome for the children who were thought to have resolved the problem at age 5;6. This group was seen to perform at a lower level in phonological skills and literacy than the controls. The existing body of findings showed a continuing discrepancy in performance between the SLI and the typical population (Knox, Botting, Simkin, & Conti-Ramsden, 2002), and sometimes even a clear decline in performance (Botting, 2005; Stothard et al., 1998; Tomblin, Freese, & Records, 1992).

Therefore, pre-school language difficulties of any kind continue to be widely recognised as indicators of future language disabilities.

2.7 Etiology

Some of the earliest arguments about the etiology of SLI posited that it was the language environment of the SLI population that failed to provide them with optimal input required for normal language development. However, suggestions arising from the few studies dedicated in this investigation indicated that even striking differences in the input had little effects in children's language acquisition (cf. Harris, 1992). A minimum exposure was deemed required for a child to develop language, but beyond that there was very little facilitative impact. Harris professed, "... what I am proposing is a threshold model in which what matters is that there be a sufficiency of the right kind of experience. If the child receives linguistic input that does not provide such a sufficiency, then early language development will be affected. But if this sufficiency is greatly exceeded, there will be little or no additional facilitatory effect" (pp. 44-45). Additionally, it was often suggested that if the caretaker speech accelerated any progress, it was the one of vocabulary; syntactic development was generally beyond deliberate facilitation (Bishop, 1997).

Since the external context did not appear to contribute to any significant degree to the manifestation of SLI in children, the search concentrated on biological determinants. The finding that SLI ran in families indicated a genetic contribution, and it was confirmed in several studies (e.g. Tomblin, 1996). Rice, Haney, & Wexler (1998) investigated a family of multiple members with language impairment and discovered that 22% of the members had a history of

language impairment, whereas it was only 7% among the control families. To rule out the possibility of the effects of inappropriate language models in the environment, twin studies are commonly conducted. Since the twins share the same language environment, any notable difference in their language performance can be credited to genetic factors. Studies involving the monozygotic and the dizygotic twins revealed that the pairs in the former group had significant similarities between them, which was not found in the latter group (e.g. Bishop, North, & Donlan, 1995). The result that twins with the same set of genes (monozygotic) showed more concordance than the ones sharing half the set (dizygotic) was indicative of a genetic contribution to language impairment.

The confirmation of a genetic contribution, however, does not suggest a bleak possibility of amelioration. The language impaired population may inherit certain features in favour of the disability through genes, but they are not the sole determinants of the ultimate outcomes. “All human behavior is the product of complex interactions between biological make-up and environmental experiences” (Bishop, 1997, p. 49). Therefore, any change brought into the environment through intervention is potentially able to improve the condition.

2.8 Theoretical Accounts of SLI

As a developmental disorder, SLI was viewed from two broad perspectives. One of the explanations claimed that SLI was a language-specific disorder and therefore, it employed a linguistic framework. On the other hand, the cognitive view suggested that SLI involved a deficit of a more general nature. The following section presents a set of proposals that explained the

morphosyntactic characteristics of children with SLI. Some of the proposals described here were also presented in the previous chapter with regard to typical language development.

2.8.1 The linguistic account. The linguistic account of SLI was motivated by the suggestion made by Chomsky (1957) that language was modular. According to Chomsky, language could not be acquired only through external facilitation; there must be an innate faculty that made it possible to pick up the language at an amazing rate with remarkable accuracy. Subsequently it was also claimed that a language disorder resulting in a morpho-syntactic deficit in particular, must be a domain-specific disorder (van der Lely, 1997; 2005). Researchers supporting this account predicted “a primary, domain-specific deficit in the computational system” (van der Lely & Christian, 2000, p. 34) or, in other words, a deficit in the underlying grammar that caused the difficulty with particular components of language. Several hypotheses to explain the linguistic performance of children with SLI was proposed within the linguistic framework.

2.8.1.1 Extended Optional Infinitive (EOI) and Extended Unique Checking Constraint (EUCC). This account of SLI was inspired by the finding that English-speaking children with SLI (ESLI) were found to have extraordinary problems with tense marking. Areas that presented marked difficulty for ESLI children were 3rd person singular –s, past regular –ed and *be* verbs.

The Extended Optional Infinitive (EOI) theory originated from Wexler’s (1994) proposal that typically developing children reached a phase in their development sequence where they were familiar with the concept of finiteness, but not aware of the obligatory nature of it in main clauses. These children, however, moved out of this *optional infinitive stage* and began to mark

finiteness in due course. With reference to the data from the ESLI children, subsequently, Rice, Wexler, and Cleave (1995) proposed that the children with SLI spent a protracted period of time at this stage and often the issue was never resolved. Hence, this hypothesis was named the Extended Optional Infinitive (EOI) account. Rice and her colleagues claimed that at this stage, children with SLI, like typically-developing children, found it difficult to understand that tense must be marked in sentences which often resulted in their production of non-finite verb forms. A corollary of the hypothesis was that these children tended to drop tense marking on verbs but they were very unlikely to mark verbs where that was not accepted. In other words, the errors exhibited were commonly due to omission but almost never due to commission (Redmond & Rice, 2001; Rice, Wexler, & Redmond, 1999).

This proposal was a response to the findings of the study conducted by Rice et al (1995). Compared with two groups of typically developing children (MLU-matched age 3 and age-matched age 5), 21 children with SLI displayed striking differences in performance. The results revealed that the past regular morpheme *-ed* was used correctly by the MLU-matched and age-matched groups in 50% and 92% of the utterances respectively, whereas the accuracy rate was as low as 27% for the children with SLI.

However, crosslinguistic evidence posed a serious challenge for this proposal. The scope of the original proposal was extremely narrow in leaving out the non-tense errors (e.g. noun plural marking) that the SLI population often displayed (e.g. Leonard, Bortolini, Caselli, McGregor, & Sabbadini, 1992). This led to a revision of the original hypothesis and subsequently the Agreement/Tense Omission Model (ATOM) (Schutze & Wexler, 1996; Wexler,

Schutze, & Rice, 1998) was proposed. Schutze and Wexler (1996) reported utterances such as *Her jumped*, instead of *She jumped*. The problem in case marking (a non-tense element) goes beyond the scope of the EOI proposal. Hence, a revised form of the EOI emerged through the Agreement/Tense Omission Model positing that either tense or agreement might be thought to be optional at this stage.

However, the ATOM too failed to explain some of the errors found in the crosslinguistic literature. For example, Italian children with SLI did not replace the verb forms requiring tense and agreement markings with nonfinite verb forms. Interestingly, languages like Italian and Spanish allow null-subjects, which is an important revelation vis-à-vis agreement. This initiated a new proposal by Wexler (1998; 2003) called Extended Unique Checking Constraint (EUCC). Within the feature-checking framework, Wexler assumes that in a language like English, a Determiner feature in the Determiner Phrase (DP) checks against two functional categories: Tense (T) or Agreement (AGR), whereas in null-subject languages the checking is required at T only. Wexler suggested that all children experience a constraint in the developmental sequence where a Determiner feature in the DP can check only against one functional category: T or AGR. This constraint magnifies for the SLI children, because this period is exceedingly long for them (therefore, an extended constraint). The limitation results in erroneous utterances when checking is required at both points. This explains the errors found in languages like English and German (e.g. *She sing well* or *They plays football*). However, in null-subject languages where checking is only required at T, the constraint is not violated, and appropriately marked utterances can be produced.

2.8.1.2 Missing features and the rule deficit hypotheses. The missing features hypothesis (Gopnik, 1990a, 1990b) assumes that the features related to person, gender, number and tense are absent in the underlying grammar of the SLI population. “Because these features are absent, both morphophonemic rules as well as rules that match features in the syntax will be missing” (Leonard et al., 1992, p. 154). The proposal adds that the phonetic forms of those features might surface in the utterances of the affected population, but not with the corresponding functions. In other words, the features might be produced in contexts that do not demand them. Therefore, the hypothesis suggests a functional absence of certain features. However, this position has been revised and the current form of the hypothesis looks at SLI as the inability to form the implicit rules related to the features.

If the claims of the hypotheses are true, then the features and the corresponding rules should never appear with correct functions. However, in a subsequent study Gopnik and Crago (1991) found their participants to have a reduced rate of production of the correct grammatical forms which clearly did not indicate an absolute absence of the morphemes. However, the researchers did not consider this phenomenon to have disproved their hypothesis. According to them, the stark difference in performance was to be credited to the deficits in rule formation, and the occasional correct utterances were due to either memorisation of the inflected forms or application of consciously learnt metalinguistic rules.

2.8.1.3 Missing agreement or the agreement deficit hypothesis. Another proposal that regards SLI as a linguistic deficit is the missing agreement or the agreement deficit hypothesis proposed by Clahsen and his colleagues (Clahsen, 1989; Clahsen & Hansen, 1997; Clahsen &

Dalalakis, 1999; Eisenbeiss, Bartke, & Clahsen, 2005). According to this proposal, the deficit is a syntactic one that affects agreement. “Children with SLI lack the knowledge of asymmetrical relationships between categories where one category controls the other” (Bortolini et al., 1998, p. 2). This results in difficulty in dealing with grammatical operations involving agreement. For instance, the hypothesis predicts that person, number and gender markers on verbs and copula, and gender and number agreement between nouns and determiners are likely to be difficult for the affected children. These areas of agreement should be problematic for the SLI population even in null-subject languages (Clahsen & Dalalakis, 1999). On the other hand, since plural markers on nouns do not involve agreement, these should be relatively spared. Interestingly, this proposal does not predict any problem with tense in particular.

2.8.2 The cognitive account. The cognitive account of SLI predicts a general processing deficit that involves limitations in both linguistic and nonlinguistic domains. This account posits that the process of language learning interacts with several other cognitive components, and therefore a deficit affecting only language is very unlikely. Additionally, the task of language learning involves complex processes and it is highly plausible that faced with limitation in resources it would suffer severely (Hulme & Snowling, 2009). Therefore, researchers within this framework investigate impairments in auditory processing capacity, working memory and processing speed to determine whether these nonlinguistic abilities have any bearing on language learning.

2.8.2.1 Generalised slowing account. Many researchers worked with affected children and investigated their performance on nonlinguistic tasks in order to identify the specificity of

the impairment. Many studies concluded that children with language impairment were also poorer than their age-matched peers on a range of tasks requiring them to match objects and make inferences about visual stories (e.g. Montgomery, 1993; Ellis Weismer, 1985; Bishop, 1992; Leonard, 2014a).

A common assumption drawn from these findings was that these children were likely to have limitations in processing speed. This claim was reinforced by findings like slower short-term memory scanning (Sininger et al., 1989), slower mental rotation of unfamiliar pictures (Ellis Weismer, 1993) etc. These led Kail (1994) to propose that the affected children were generally slower than the controls, by a constant proportion, in responding to all types of tasks. The completion of any task requires completing several smaller tasks. For anyone, the amount of time required for the completion of the main task depends on the number of sub-tasks involved. The claim was that a child with SLI would suffer from slowness at every sub-task and eventually would complete the main task at a considerably slower rate than an unaffected child.

This view apparently has an instinctive approval. If a child suffers from a general slowness, she may be able to hypothesise the function of a morpheme (e.g. past *-ed* in English), but be unable to process it fast enough to identify the morpheme in continuous speech, hypothesise its grammatical function, and store it before moving on to the next component (Leonard et al., 2007). An additional suggestion has been extended within the scope of this hypothesis that focuses on grammatical morphology in particular. Language components that

require an extraordinary amount of processing time may be disproportionately vulnerable in the face of a deficit in speed of processing (Miller et al., 2001).

2.8.2.2 Auditory processing deficit account. This proposal originated relatively earlier than the rest. Tallal and her colleagues proposed that children with language impairment experience a low-level auditory processing deficit, which adversely affects speech perception and subsequently, language development. To test this Tallal and Piercy (1973b) devised the Auditory Repetition Task (ART), on which the children with SLI performed distinctively worse when the tones were brief and the interval between the tones was very short. A supplementary finding (Tallal & Piercy, 1974) showed that the SLI children had poor performance on repeating a sequence of plosives where the critical contrast appeared in the first few milliseconds; however, they did not have a remarkable difference in performance when the contrast point had longer durations. This proposal (also known as the temporal processing deficit hypothesis) appears to be significant for research in language impairment, because natural speech contains streams of sounds to be identified and deciphered. In a situation where processing low-level auditory stimuli is affected, speech perception can be expected to be considerably damaged.

2.8.3 The cognitive-linguistic account. The linguistic and the cognitive approaches to specific language impairment are fairly exclusive of each other. Whereas one assumes that the problem primarily lies in the underlying grammar that has a direct repercussion for the language performance of the children, the other posits that the poor performance is a by-product of a deficit of a more general kind. Acknowledging one often means nullifying the other although each of them contains convincing arguments towards an explanation of the disorder.

However, none of the accounts within the two approaches have been able to account for the manifestations found from the crosslinguistic data completely. Therefore, recent researchers adopt an eclectic approach of the linguistic-cognitive realm.

2.8.3.1 *Surface hypothesis.* This proposal incorporates a considerable body of detail from previous suggestions and findings. The impact of perceptual salience on grammatical features, the processing limitations of the affected population, and the crosslinguistic data suggesting the effect of frequency, regularity and saliency on language development have been some of the key issues of this proposal. This proposal attributes a particular importance to the physical properties of the grammatical markers which engenders the term 'surface' account.

The literature on typical language development show that the difficult grammatical morphemes in English tend to be of low-phonetic substance, which means they are nonsyllabic or are unstressed syllables with relatively shorter duration than the neighbouring morphemes (Leonard, 1989). Morphemes playing the same function in other languages are likely to be acquired earlier provided higher perceptual saliency. This hints at a possibility that the difficulty of the grammatical morphemes may be largely regulated by their surface features. Based on this understanding, Leonard (1989; 1992) proposed that children with language impairment had limited processing capacity, which directly affected the grammatical morphemes of brief duration. The assumption was that children with language problems were not blind towards the brief sounds in general; instead these children were challenged with completing many real time operations including identifying grammatical morphemes, hypothesizing their functions and correctly storing them in the morphological paradigm, which eventually adversely affected the

processing of those brief grammatical components (Bortolini, Leonard, & Caselli, 1998; Hulme & Snowling, 2009; Kunnari et al., 2011; Leonard, 2014a; Leonard et al., 1992; Leonard et al., 1997). Leonard and his colleagues professed (1992), “...although SLI children might be able to perceive and produce forms such as word-final consonants and unstressed syllables in non-morphophonemic contexts, the already greater perceptual and production demands placed on them by these surface properties limit the resources available to these children for the additional operations of hypothesizing the grammatical function of a form and placing it in a morphological paradigm” (p. 153).

The impact of the short duration is not a peculiar factor for language development of the children with SLI. Data from typical development in English too show that a more salient progressive *-ing* morpheme is acquired before the brief morpheme past *-ed*. Also, the plural marker *-s* is hypothesized before the 3rd person singular *-s* because the acquisition of the latter involves understanding the agent and all the corresponding markers on verbs. Unlike the affected children, the typically developing children learn to manage these processing demands early. Faced with processing limitations, the SLI children are considered to be taxed more while processing these grammatical markers. The brevity of the items to be processed simply adds to the other existing operations and often this results in incomplete processing with compromised elements. A corollary of the proposal is that the affected children will require a greater number of exposures before they can internalise the markers. This emerges from the assumption that incomplete processing does not serve as positive evidence and does not contribute to paradigm building, and therefore more encounters will need to be provided in order to ensure learning (Leonard, et al., 1997).

Substantial evidence for the surface account comes from crosslinguistic findings. Unlike English, the 3rd person singular marker in Italian, -e is relatively salient and as expected from this proposal, it is not a locus of difficulty for children with SLI. Additionally, Leonard and his colleagues gathered data from Italian-speaking (Leonard et al., 1987) and Hebrew-speaking (Rom & Leonard, 1990) children with SLI showing that the affected children and the unaffected MLU controls did not perform differently when the input contained stressed and vowel-final syllabic inflections. On the other hand, affected children did not process the unstressed monosyllabic function words as well as their MLU-matched peers.

2.8.3.2 Morphological richness or the sparse morphology account. This proposal has been forwarded as a suggestion from a range of crosslinguistic studies (e.g. Bedore & Leonard, 2001; Dromi et al., 1999; Leonard et al., 1987; Linder & Johnston, 1992; Lukacs et al., 2009; Rom & Leonard, 1990; Stokes & Fletcher, 2003). As mentioned above, the surface account was able to explain crosslinguistic findings to a great extent; however a striking revelation from a comparative analysis of data in English and other languages suggested other possibilities. German-speaking children with SLI exhibited difficulty with grammatical morphemes, but their rate of accuracy in corresponding morphemes was considerably higher than the rate found for English-speaking children with SLI (Lindner & Johnston, 1992). The explanation lies within the proposal that the linguistic impact of the processing limitations is largely governed by the morphological richness of the language. A language with infrequent grammatical morphemes draws more attention to the other more noticeable and dependable cues in a situation when paying attention to all the elements is not possible due to processing limitations. On the other hand, a language with rich morphology provides a learner with ample examples of grammatical

morphemes which eventually become the priority of the learner. Therefore, this proposal predicts that a typically developing child learning a morphologically rich language will master the grammatical markers much faster than a typically developing child speaking a sparse morphology language, and a child with SLI speaking a 'rich' language will perform much better than another child with SLI speaking a morphologically sparse language. However, there is an ongoing debate about the definiteness of the notion of morphological richness of a language (Bortolini et al., 1998).

Unlike the surface account, this proposal does not consider the salience of the grammatical morpheme and the speed of processing to be of particular significance; rather the determining factors here are the processing limitation and the number of morphological embellishments in a language. In a language such as English, affected children devote their limited resources to the more prominent grammatical signals like word order, which leaves very few resources for the other not-so-frequent cues like verb inflections. The implication is that children with SLI speaking English is likely to require more encounters with the grammatical items to acquire them, and meanwhile their comprehension and production of these morphemes tend to be compromised (Kunnari et al., 2011; Fletcher et al., 2005). In contrast, due to the ubiquitous grammatical morphemes, the affected children speaking morphologically rich languages tend to utilise their resources for processing them, and eventually they master them much better than their counterparts speaking sparse languages.

However, even within the rich languages performance may vary due to the amount of intricacy in the grammatical paradigm. If a child with SLI is required to pay attention to many

dimensions for processing a verb (tense, aspect, gender, person etc.), errors may arise in the interim period between the first exposure to the item and the mastery of it. Interestingly, these errors are typically substitutions with other inflected forms that are different from the target forms by just one dimension (e.g. Bedore & Leonard, 2001; Lukacs et al., 2009; Dromi et al., 1999). Hence, the production of a 3rd person present singular feminine verb form is more likely to be substituted by a 3rd person present singular masculine than a 2nd person present plural masculine form. The proposal also posits that if the errors project anything other than the 'near-misses', the substitutions will result from the frequency effect, i.e. the forms with the highest frequency will substitute the target forms (Kunnari et al., 2011; Lukacs et al., 2009). Therefore, it is assumed that retrieval is primarily driven by the similarity in features, and only high frequency forms may alter the near-miss patterns due to their strength in the paradigm. Finally, the proposal suggests that the grammatical markers are not prioritised, i.e. no one dimension should be particularly easy or compromised.

Leonard (2014a) suggested that future research around this account should determine the limits to the benefits of a rich morphology. He added that rich morphology should be facilitative only when it exhibited a fair amount of consistency and regularity. If the morphological system itself is a complex one, then those intricacies may, instead, turn out to be debilitating, as reflected in some recent studies (Abdalla & Crago, 2008; Kunnari et al., 2011).

2.9 Evaluating the Theories

Continued research in the field of language impairment has not only investigated the nature of the language disability that children experience, but also attempted to identify a

convincing account of the problem. Motivated by the term 'specific language impairment', some of the initial accounts have regarded it as a purely linguistic deficit. However, this notion of a deficit selectively affecting language does not appear to be convincing. Also, the findings from the studies are often not explained well by the proposals within this stream. The view forwarded by Gopnik and her colleagues that the language system of the children with SLI lacks the linguistic features of person, number and tense (Gopnik & Crago, 1991) has been refuted in many subsequent studies. It has been observed that although, children with SLI perform poorly on the grammatical markers, often they produce the inflected forms correctly above the chance level (e.g. Leonard et al., 1997; Leonard et al., 1992). Also, the fact that these children are often able to attach correct markers to non-sense words clearly contradicts the possibility of rote learning (Hulme & Snowling, 2009). Besides, Leonard and his colleagues (1992) found that the Italian SLI children were much better in processing disyllabic verb stems compared to longer stems. If the grammatical features or the underlying rules are missing in general, it should translate into similar performance irrespective of the stem length, which is not the case here. In a similar vein, the agreement deficit account (Clahsen et al., 1997; Clahsen & Dalalakis, 1999; Eisenbeiss et al., 2005) is also unable to predict much of the crosslinguistic data. This proposal does not expect any remarkable difficulty with tense in particular; however, Leonard and his colleagues revealed that among the affected Hungarian children's one-dimensional errors, 34% were tense errors (Lukacs et al., 2009). Secondly, although Italian articles required agreement, children with SLI speaking Italian did not perform any worse than children with SLI speaking English. Moreover, even when children produced deviant forms, they displayed some understanding of the agreement or features by often maintaining the markers partially

(Bortolini et al., 1998). Another proposal emerging from the linguistic perspective, the Extended Unique Checking Constraint (the revised rendition of the EOI), successfully predicted the performance of Swedish-speaking children with SLI in copula and present and past tense inflections (Leonard et al., 2004). Nevertheless, a significant share of the Finnish errors did not conform to the EUCC (Kunnari et al., 2011). It seems that an explanation specific to linguistic entities is not very effective for explaining the language performance of the children with SLI, because languages vary remarkably in terms of their structural properties. Above all, findings suggesting differences in the degree of accuracy of the markers governed by the morphological richness of the ambient language (Leonard, 2014a) further question the validity of the linguistic accounts.

These findings have generated a growing interest among researchers to look for a broader deficit in cognition. A proposal within the cognitive approach suggests a deficit in auditory processing in the absence of any hearing difficulty. Although this view has an instinctive appeal, a sizeable body of research has gathered evidence showing no strong pattern (see Bishop, 2007, for a review). In addition, many researchers, who set out to evaluate linguistic accounts in light of the crosslinguistic data, often suggested a processing limitation (e.g. Abdalla & Crago, 2008; Bishop, 1994). However, a general cognitive deficit may be hard to demonstrate simply because of the strong claims it entails. The classic cases of SLI do not exhibit significant difficulties in any area other than language. Therefore, the suggestion that a general deficit in cognition affects only a selective skill requires more compelling evidence.

However, it will be unwise to nullify the approaches entirely, since they have been motivated by strong evidence. Their merits have been further confirmed by the hypotheses that hold an eclectic perspective. The proposals within this framework seem to have gathered maximum support from the crosslinguistic findings. The surface account has been successful to a great extent in supplying an explanation to the disorder (see, Leonard, 2014a); however, the view that the difficulty is primarily regulated by perceptual saliency has not been able to account for many patterns found (Leonard et al., 2011; Fletcher et al., 2009; Fletcher et al., 2005). Most of these issues have been answered through the other dominant proposal within this approach, the morphological richness account, which has probably explained the maximum findings in hand so far. Nevertheless, findings from the Finnish study (Kunnari et al., 2011) have presented a pattern that is hard to explain within this framework. The children with SLI have exhibited a relatively poor performance despite many morphological embellishments in Finnish. Besides, the errors displayed are often not near-misses. However, the authors have not amended the proposal; instead they suggest that it is the extraordinarily complex nature of the verb morphology that may have intensified the representation of the problem. A final comment on the theoretical suggestions comes from Acarlar and Johnston (2011) suggesting that even within the rich morphology languages, two groups of the affected children may project varying difficulties depending on the linguistic properties of those languages.

The understanding of the current proposal clearly suggests the complexities underlying the conceptualisation of the disorder and the number of possible explanations it may be open to. We, at present, do not have a concrete account of SLI. However, the increasing amount of

findings are inspiring and they are indicators that future studies will offer more convincing theoretical suggestions about the disorder.

2.10 Importance of Crosslinguistic Research

The study of SLI was fairly uniform and confined to English before crosslinguistic studies began. The proposals advanced in order to account for the linguistic pattern observed were successful in explaining the English SLI data. However, the crosslinguistic investigations changed the picture entirely. The Italian, Hebrew and Spanish data from the affected population revealed that verb inflections considered difficult so far, did not notably challenge the children with SLI speaking these languages (e.g. Bortolini et al., 1997; Bortolini et al., 1998; Dromi et al., 1999; Leonard, 2000; Bedore & Leonard, 2001). For instance, instead of poor performance on verb inflections, children with SLI speaking Italian displayed difficulties in marking clitic pronouns and articles (Leonard et al., 1992). Consistent with these findings were data from German and Swedish revealing that the accuracy rates for the children with SLI speaking these languages surpassed the scores of the English-speaking affected children, although their scores were considerably lower than the MLU controls (Leonard et al., 2004; Hansson et al., 2000; Roberts & Leonard, 1997). Some of the recent research in languages such as Hungarian, Finnish and Arabic, in addition, revealed performance differences between the SLI and the MLU groups; however, their error patterns were far from production of non-finite bare forms (Kunnari et al., 2011; Lukacs et al., 2009; Abdalla & Crago; 2008). Unlike the dominant pattern of omission errors, i.e. production of infinitives in English, errors in most rich-morphology languages resulted in substitution that deviated from the target form just by one dimension. Finally,

findings from studies conducted in a range of typologically different languages did not conform to the existing suggestions and opened possibilities for new perspectives. Performance of the affected children in Turkish (Acarlar & Johnston, 2011) showed that the affected children had strikingly high performance in most of the verb inflections with accuracy rates above 90% in most of the cases, and interestingly enough, noun morphology was found to be the locus of the challenge for the Turkish-speaking children with language impairment. Noun morphology was also found challenging in languages like Hebrew (Dromi et al., 1993), Swedish (Leonard et al., 2001) and German (Clahsen, 1991), in spite of no significant evidence from some of the compelling studies in English (e.g. Oetting & Rice, 1993).

The crosslinguistic findings are diverse and difficult to accommodate given most proposals. However, the lack of uniformity in findings has contributed to the study of specific language impairment in important ways. Firstly, studies conducted in different languages of the world have opened the possibility of reviewing the existing approaches to language impairment, and forwarded important suggestions about the possible nature of the deficit. These alternative hypotheses arising from crosslinguistic data would not have been possible had the research been restricted to studying English only. It is available to our knowledge now that aspects of the language typology such as word order, agglutination and morphological richness can contribute in important ways, which would have never been explored if data were collected from only one language to determine the nature of the disorder. Secondly, the increasing amount of new revelations is also supplying information about the 'other' areas of language that can be affected. For example, the morphology in Cantonese is very basic with verbs not marking for tense, person or number. Therefore, the conventional investigations are

not possible in this language. This has led the research to another direction, and studies have revealed that the impairment appears to affect aspect marking and its distribution (Stokes & Fletcher, 2003; Fletcher et al., 2005). A final rationale for continued crosslinguistic research is to obtain useful information in order to serve a greater number of people affected by the disorder (Leonard, 2014a).

To conclude, the language performance of the affected children is often not comparable across languages. The linguistic properties of the ambient language play a crucial role in determining the pattern manifested. A child with SLI speaking a sparse-morphology language, therefore, only appears to perform much worse than another child with SLI exposed to a morphologically rich language. Acknowledging these typological differences, crosslinguistic investigations on SLI should be continued in order to make more precise judgements about the disorder and to provide interventions accordingly.

Chapter Three

A Description of Bangla

3.1 A Brief Account of Origin and Development

Bangla or Bengali belongs to the Indo-Aryan language family along with many Indian languages like Hindi, Bihari, Oriya, Assamese, Maithili and Magadhi. As a member of this language family, Bangla historically connects itself to Russian, Irish, French and Greek. The origin of Bangla can be traced back to 3500 BC in the form of an Indo-Aryan language, Satam (Banglapedia, 2003). Whereas the Iranian branch has formed Persian and some Medic languages spoken in central Asia, the Indic stream has resulted in languages like Vedic and Old Indo-Aryan. Sanskrit (600- 650 BC) can be identified as a major language from which Bangla branched out through an intermediate language- Prakrit. The Prakrit languages spoken in different regions of ancient India, in due course, experienced *Apabhramsa* or the stage of 'non-grammatical language' which has formed languages like Bihari, Oriya, Bangla and Assamese (Figure 3.1). Bangla and Assamese are the two easternmost languages of the Indo-European family, whereas Celtic Irish and Germanic Icelandic are the two westernmost (Chatterji, 1993). Regionally, Bangla is surrounded by Oriya, Maithili and Magadhi on the west and Assamese on the east. However, some Sino-Tibetan and Austric languages prevail within and on the boundary of the region.

As identified in Banglapedia (2003), Bangla has flourished through three distinct stages of development: the stage of Old Bangla (900- 1350), Medieval Bangla (1350- 1800) and

Modern Bangla (1800- to present time). Although Modern Bangla constitutes the current stage, Bangla, like any other language in use, is dynamic and is reshaping itself with time. The issues regarding language change and dialects will be discussed later.

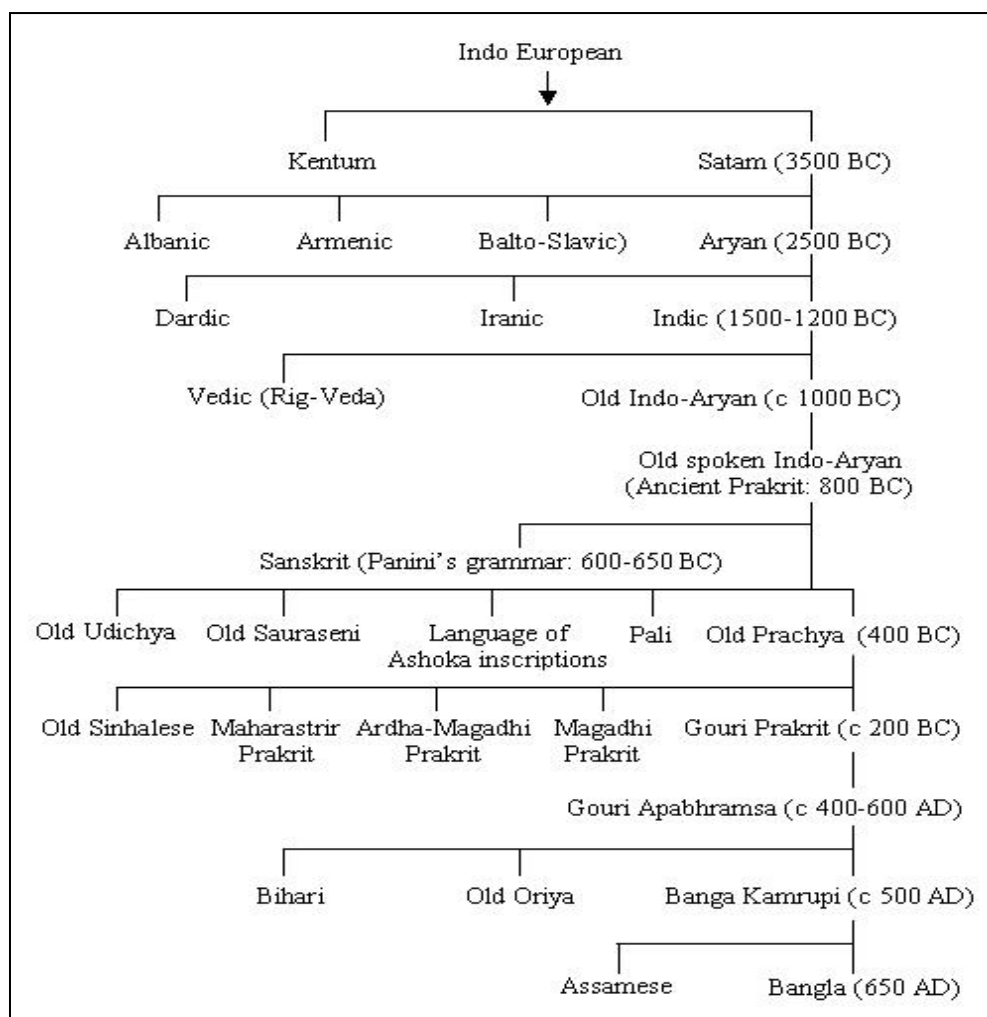


Figure 3.1. Origin and development of Indo-Aryan languages, from *Banglapaedia* (2003).

3.1.1 Regional scope of the language. Bangla is widely spoken in Bangladesh and in the Indian states of Pashchim Banga (formerly West Bengal), Assam and Tripura. Bangla has over

107 million first language speakers in Bangladesh (Bangladesh Bureau of Statistics, 2011) and 83 million speakers in different states of India (Encyclopaedia Britannica, 2014). Bangla is also spoken among migrant population in several countries, for example the USA, UK, Australia and Canada, and also in many Middle-Eastern countries. Bangla is the national language of Bangladesh with 98% of its population using the language (Bangladesh Bureau of Statistics, 2011). It is one of the official languages of Pashchim Banga, Assam and Tripura with speakers constituting 8.1% of the total population (Census of India, 2011). With approximately 250 million first and second language speakers in total, Bangla now is the 6th among the most widely spoken language of the world (Comrie, 2005; Klaiman, 2008).

3.1.2 Variety and forms. Modern Bangla developed two distinct forms to be used with different purposes. *Shadhu bhasha* or the literary form was used mostly by the educated class in 19th century Bengal for literary purposes. On the other hand, *chalita bhasha* or the colloquial form was the manifestation of the common language used widely for informal and day-to-day purposes. Although one would come across a vast collection of literature in *shadhu bhasha* in the 19th and the early 20th century Bengal, *chalita bhasha* began to receive wider acceptance in the 20th Century and currently the term Standard Bangla refers to the *chalita bhasha* of that time, and *shadhu bhasha* is not in use anymore.

As identified by Dasgupta (2007), the structural difference between the two versions lies in the inflectional and pronominal systems. The pronoun and verb forms used in *shadhu bhasha* have been transformed into their counterparts in *chalita bhasha* primarily by shortening and simplification. These transformations often follow phonological regularities. For example, *boliya*

(having said) → *bole*, *koriya* (having done) → *kore*, and *tahara* (they) → *tara*, *tahader* → *tader* etc.

Due to the successive foreign governance of Bengal, the language has often experienced external linguistic influences. The standard Bangla lexicon, therefore, owes numerous words to Persian, Arabic, English, French, Portugese, Dutch etc. For example, over 2000 Arabic and Persian words of administration, war, crafts, culture and law can be found in today's standard Bangla (Banglapedia, 2003). Apart from these languages, two non-Aryan languages, Dravidian and Kol have also contributed to the formation of today's Bangla lexicon.

The early educated Bengali class belonged mostly to the western part of Bengal with Calcutta (presently Kolkata) being the centre of cultural development. Hence, the early standardisation came from western Bengal and this variety later became the standard and the accepted form for the greater region. "The socio-political power in West Bengal of many former Easterners and their mostly left-wing spokesmen has partially easternised the Calcutta-based Indian standard. In the other direction, publications and media material from the West have continued to enjoy a reasonable public reception in the East" (Dasgupta, 2007, pp. 387). The version transferred from the West is equally accepted in both Bengals and in other Bangla-speaking regions today as the Standard Bangla (SB). This is the form used and expected in official documents, literature (if not demanded otherwise) and in formal contexts.

Although it has been possible to maintain a relatively consistent version of Bangla in official situations, mainly in writing, the spoken version has varied significantly. This has resulted in numerous dialects spoken in various regions of greater Bengal. Chatterji (1993)

identifies four dialects at play, namely *Radhi*, *Bangali*, *Varendri* and *Kamrupi*. *Radhi* dialect is spoken mainly in south-western Bengal from which eventually the SB emerges, whereas *Bangali* is spoken in the east and south-eastern parts of Bengal. Even within the geographical boundary of the present Bangladesh, one can find a wide variety of dialects. The people of north-western Bangladesh speak a dialect that is remarkably different from those found in eastern or south-eastern Bangladesh. Language follows its own course and extends beyond geographical boundaries. Therefore, the dialect(s) of north-western Bangladesh are very similar to the neighbouring areas belonging to the present India. On the other hand, the dialects of the eastern Bangladesh (Sylhet, Noakhali, Chittagong) side with Assamese and some tribal languages in the vicinity so much that they have grown to be very different from the SB. However, irrespective of the dialects spoken, SB continues to be accepted and understood by the majority of the population living in greater Bengal. In fact, as Chowdhury (1960) states, most educated Bengalis today understand three forms of Bangla: the High Bangla (*shadhu bhasha*), Standard Bangla (*chalita bhasha*) and a local dialect.

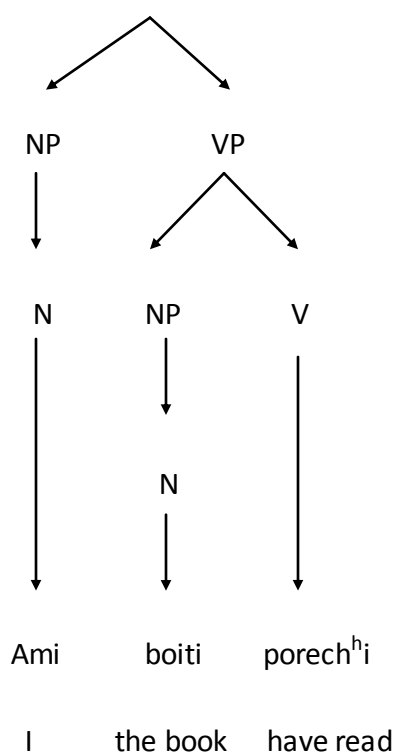
The presence of the two forms of Bangla, the spoken and the written forms, once created a situation of diglossia, where one form was used in writing, and another in speaking. The linguistic experience of people in Bangladesh today has motivated another context of diglossia, which is peculiar to Bangladesh. A more colloquial form has evolved in this region which, again, is understood by everyone, but not accepted for certain purposes. Along with spoken formal contexts, written discourses in newspapers, books and official documents maintain the SB. On the other hand, a parallel stream of SB, mainly different in terms of the verbal inflections, runs in informal contexts. Thus, educated Bangladeshis today are commonly

found to use SB in their offices, schools and while speaking to less familiar people, and use the relatively colloquial form while speaking to family members and friends. However, this is not a uniform situation, and today in many educated families SB is still the norm.

3.2 Syntax and Word Order

3.2.1 Sentence structure. The structure of a simple sentence in Bangla can incorporate the following components: subject, main verb, direct object, indirect object, temporal expression, spatial expression etc. The structure of a basic sentence is illustrated below:

(1) S (Ami boiti porech^{hi}/ I have read the book)



Bangla follows a head final word-order (Hayes & Lahiri, 1991), which means in any phrase the principal component has the right most position, and the tree branches out towards

the left to incorporate the other elements. Very often a sentence has more members than the sentence presented above. For example,

(2) Ayon	gotokal	amake	upoharta	dilo.
Ayon	yesterday	me	the gift	give.pst.3p

Ayon gave me the gift yesterday.

Following the head-final word order, the verb phrase above contains the temporal word, the indirect object, the direct object and finally the verb. Similarly, if a noun phrase has an adjective, it precedes the noun. For example,

(3) Ami	lal	jamati	porbo.
I	red	dress	wear.fut.1p

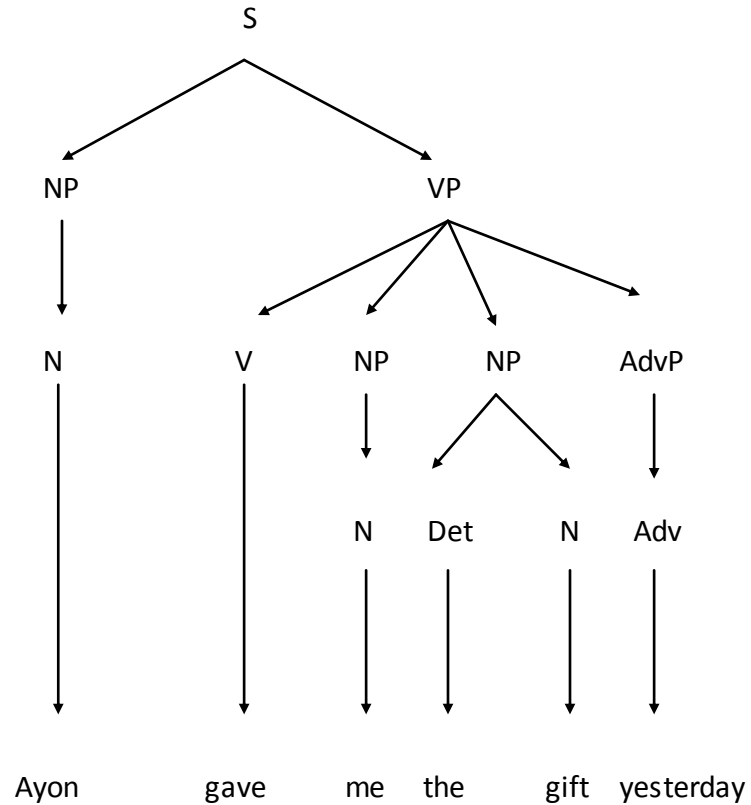
I will wear the red dress.

Therefore, the word order of Bangla sentences is generally Subject- Temporal phrase- Locative phrase- Indirect object- Direct object- Adverbial Phrase- Verb (Banglapedia, 2003).

On the other hand, English is a head-initial language with exceptions of some head-final instances. For example, sentence (2) in English will have the following representation:

(2a) Ayon gave me the gift yesterday.

Here, the verb phrase begins with the verb and the other elements follow the head.



But in English, often the head is preceded by the other components of the phrase. For example, a noun phrase with an article and an adjective will have them precede the head. Therefore, English can be called both right-branching and left-branching with the former dominating the trend, whereas Bangla is primarily left-branching.

Unlike English, in Bangla it is possible to find sentences without verbs, i.e. the copula can be unrealised in sentences. For example,

- (4) Neela khub bhalo meye.
 Neela very good girl
 Neela is a very good girl.

But, this is to note that such sentences only appear to be verbless; in fact they do have latent verbal components. So, (4) has the following syntactic representation:

(4a)	Neela	khub	bhalo	meye	(hoy).
	Neela	very	good	girl	(be.pres.3p)
	Neela is a very good girl.				

3.2.2 Bangla word order. As evident from the previous discussion, the sequence of words in a typical Bangla sentence is Subject-Object-Verb (SOV). But unlike English, this order lends itself to various alterations. For example,

(5a)	Ratri	Bishakhake	marlo.
	Ratri	Bishakha (ACC)	hit.pst.3p
	Ratri hit Bishakha.		

(5b)	Bishakhake	marlo	Ratri.
	Bishakha (ACC)	hit.pst.3p	Ratri
	Ratri hit Bishakha.		

(5c)	Bishakhake	Ratri	marlo.
	Bishakha (ACC)	Ratri	hit.pst.3p
	Ratri hit Bishakha.		

Each sentence presented above assigns the role of agent and patient to Ratri and Bishakha respectively, and essentially conveys the same meaning. On the other hand, in English meaning is highly governed by the order of the words in a sentence. Therefore, 'Bipul avoided

Shimul’ and ‘Shimul avoided Bipul’ convey opposing meaning. Also in most cases, change of word order among the basic components of the sentence results in ungrammaticality. For example, in English one can say, ‘Shimul avoided Bipul’, but not *‘avoided Bipul Shimul’.

Bangla is a language with a fairly rich morphological paradigm and agglutinative properties (see Kar, 2009 and Mazumdar, 1920, for agglutination in Bangla). The lexical entities in sentences generally take overt morphological markers that follow the stems in case of any movement. Hence, irrespective of the word order, the primary meaning does not change and it is always possible to get an unambiguous meaning. However, change of the sequence in words can bring in stylistic differences.

3.3 Bangla as a Null-Subject Language

Language typology often categorises its members in terms of whether or not they allow dropping the Subjects of the sentences. Although originally the sentences in any language must have a Subject meeting the argument structure, some languages often do away with explicit Subjects in sentences. Such languages are termed null-subject languages, and those demanding the compulsory projection of Subjects are called non-null subject languages. This classification puts Italian, Chinese, Spanish, Marathi into the former group, whereas Japanese, English, French, German etc. belong to the latter. As a fundamental criterion for a null-subject language, it is often suggested that the language must have rich agreement which allows for sentences without overt subjects. But the idea of richness of paradigm is relative and difficult to measure. Therefore, Jaeggli and Safir (1989) revised the criterion by stating that a language can have a

null subject only if it is morphologically uniform; i.e. all the forms are morphologically either derived or underived.

Bangla has a fairly rich inflectional paradigm with verbs inflecting for person, honour, tense and aspect. Additionally, Bangla verbs essentially contain inflectional markers, and the verb rarely takes a bare form. Therefore, it meets the condition for a null-subject language. The following sentences can be discussed for the purpose of demonstration.

6a) Gari	thik korchhi.	6a') *Fixing the car.
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car	fix.pres.prog.1p
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I am fixing the car.

6b) Eta	korle	keno?	6b') *Why did do this?
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this	do.pst.2p	why
------	-----------	-----

Why did you do this?

6c) Ekhon	kemon	ach ^h e?	6c') *How is now?
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now	how	be.pres.3p
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How is he now?

Each of the sentences in (6a), (6b) and (6c) are grammatical in Bangla, and as it can be seen they do not project subjects. Yet, in each case meaning can be extracted from the inflected verbs with distinct markings. It is noteworthy that the corresponding utterances in 6a'), 6b') and 6c') in English are all ungrammatical without the explicit subjects. The examples suggest that unlike Bangla, English is a non-null subject language because it does not maintain morphological uniformity (verbs are not always derived).

3.4 Verb Morphology in Standard Bangla

One can find the richness of Bangla morphology truly reflected in its verbal system. Bangla verbs exhibit agglutinative properties in its morphological paradigm. In other words, verbal inflections are suffixed to the verbs with each having a distinct morphological significance. For example, the inflected verb form 'lik^hech^hilam' (had written) contains the verb root /lik^h-, the perfective aspect marker /-ech^hi-, the past tense marker /-l-/ and the first person marker /-am/. Because the Bangla verbal paradigm accommodates all of the morphosyntactic information in the verb form, often it is possible to dispense with the subjects and the temporal phrases without causing any confusion in meaning. Also, the verbal system is linear and transparent to a great extent. This is summarised in the following section.

3.4.1 Types of verb bases. According to Bhattacharya (1993), standard Bangla verb bases are of three types.

- 1) **Simple base.** The simple bases contain verb roots in their most rudimentary forms. They can have both vowel and consonantal endings. For example, /a~k-/ (to draw), /ga-/ (to sing) etc. Both groups are fairly uniform in their system of inflections. However, in particular contexts, they cause phonological variations to the suffixes to be attached. This will be discussed later in detail.

Often the simple base takes up the causative marker /-a-/ to create a secondary verb root: the causative root. For instance, /dek^h-/ is equivalent to the English root /to see/. Once the causative marker /-a-/ is added to it, /dek^ha-/ becomes a secondary verb root

meaning ‘to cause to look’. For inflectional operations, the causative verb roots, then, behave like the basic roots ending in vowels.

2) *Conjunct base.* A conjunct base comprises of a noun or an adjective followed by a small set of basic verb roots like /ho-/ (to be), /kor-/ (to do), /pa-/ (to get), /ja-/ (to go) etc. It is interesting to note that many commonly used verb roots in English take the conjunct form in Bangla. For example, /ranna kor-/ (to cook) and /kaj kor-/ (to work) are verbs with conjunct bases with verbs preceded by nouns (cooking and work), whereas /shustho ho-/ (to recover) is an example of verb preceded by adjective (healthy) etc.

3) *Compound base.* A compound base has two verbs: one non-finite and another finite. The main verb attaches the perfective marker /-e-/ creating an non-finite form and precedes a light verb containing the finiteness and the other inflectional markers. For example, /p^hire ash-/ (to return), /k^heye p^hel-/ (to complete eating), /heshe ot^h-/ (to begin laughing) etc.

3.4.2 Infinitive verb markings. The infinitive verb forms can have several representations. For example, the verb root /kor-/ (to do) may take up the following forms: verbal noun /kora/, completive /kore/, conditional /korle/ and inchoative /korte/.

3.4.3 Verb inflectional paradigm in standard Bangla. As mentioned previously, Bangla verbs (finite) are marked for aspect and tense, and they agree with the nominative subjects in person. Bangla verbs are also marked for honour sometimes, when referring to an agent deemed superior in age or any other respect (Thompson, 2012). The representation of these distinct markers can be understood from the following illustrations:

7) Amra ek ghonta **hetech^hilam.**

we one hour walk.pst.perf.1p

We had walked for an hour.

(/hat-/ + /-ech^hi-/ + /-l-/ + /-am/)

(root+ perfective+ tense+ person)

8) Ch^hatrara monojog diye **likhch^he.**

students attention with write.pres.prog.3p

Students are writing attentively.

(/lik^h-/ + /-ch^h-/ + /-e/)

(root+ progressive aspect+ person)

The two sentences above show that any inflected finite verb can be marked for aspect, tense and person. They always occur in the same sequence with the root followed first by the aspect, then the tense and the person markers. Therefore, a typical inflected verb will have the following structure:

V → verb root+ aspect marker+ tense marker+ person marker

Note that not all inflectional markers have an explicit presence in a verb form always. A simple present verb form will only have a verb root and the person marker, because tense and aspect are considered to be \emptyset (null) in this form. This is why sentence (8) presented above contains three members whereas sentence (7) has four filling in all the slots.

Table 3.1

Representation of the Verbal Paradigm in the Standard Bangla

Verb root 1 (ending in a consonant): /por-/ (to read) Verb root 2 (ending in a vowel): /kha-/ (to eat)			
	Present tense		Past tense
Simple	Ami boi pori . por- Ø- Ø-i	1 st person	Ami boi porlam . por- Ø- l-am
	Ami k^hai . k ^h a- Ø- Ø-i		Ami k^helam . k ^h e- Ø- l-am
Progressive	Ami boi porch^hi . por-ch ^h - Ø-i		Ami boi porch^hilam . por-ch ^h i- l-am
	Ami k^hachch^hi . k ^h a-chch ^h -Ø-i		Ami k^hachch^hilam . k ^h a-chch ^h i-l-am
Perfect	Ami boi porech^hi . por-ech ^h - Ø-i		Ami boi porech^hilam . por-ech ^h i- l-am
	Ami k^heyech^hi . k ^h e-ech ^h - Ø-i		Ami k^heyech^hilam . k ^h e-ech ^h i-l-am
Simple	Tumi boi poro . por- Ø- Ø-o	2 nd person	Tumi boi porle . por- Ø- l-e
	Tumi k^hao . k ^h a- Ø- Ø-o		Tumi k^hele . k ^h e- Ø- l-e
Progressive	Tumi boi porch^ho . por-ch ^h - Ø-o		Tumi boi porch^hile . por-ch ^h i- l-e
	Tumi k^hachch^ho . k ^h a-chch ^h -Ø-o		Tumi k^hachch^hile . k ^h a-chch ^h i-l-e
Perfect	Tumi boi porech^ho . por-ech ^h - Ø-o		Tumi boi porech^hile . por-ech ^h i- l-e
	Tumi k^heyech^ho . k ^h e-ech ^h - Ø-o		Tumi k^heyech^hile . k ^h e-ech ^h i-l-e
Simple	She boi pore . por- Ø- Ø-e	3 rd person	She boi porlo . por- Ø- l-o
	She k^hae . k ^h a- Ø- Ø-e		She k^helo . k ^h e- Ø- l-o
Progressive	She boi porch^he . por- ch ^h - Ø-e		She boi porch^hilo . por-ch ^h i- l-o
	She k^hachch^he . k ^h a-chch ^h -Ø-e		She k^hachch^hilo . k ^h a-chch ^h i-l-o
Perfect	She boi porech^he . por- ech ^h - Ø-e		She boi porech^hilo . por-ech ^h i- l-o
	She k^heyech^he . k ^h e-ech ^h - Ø-e		She k^heyech^hilo . k ^h e-ech ^h i-l-o

Table 3.1 displays the range of the verbal system in Standard Bangla. To begin with, /-l-/ is the established past marker in Standard Bangla (Chatterji, 1993). Sentences in the present tense do not have any overt tense marking. Many researchers identify /-il-/ to be the past marker instead, which in fact is the marker in *Shadhu bhasha* (korilam > korlam). There are three distinct markers for person in Bangla. They are /-i/, /-o/ and /-e/ for 1st, 2nd and 3rd person respectively. But, their surface forms change in past tense and they become /-am/, /-e/ and /-o/ respectively.

As presented previously, Bangla also has some inflections containing aspectual information. Lahiri (2000) suggests that these aspect markers (/ch^h-, /ech^h-/ etc.) are reduced forms of the auxiliary verb /ach^h-/ (to be). The aspect markers are not governed by person. However, they do change for tense. The progressive markers for present and past tense are /-ch^h-/ and /-ch^{hi}-/ respectively and the perfective markers are /-ech^h-/ and /-ech^{hi}-/. As stated previously, the verb roots ending in vowels and in consonants behave differently in the process of suffixation. In standard Bangla, the progressive /-ch^h-/ and /-ch^{hi}-/ markers become /-chch^h-/ and /-chch^{hi}-/ respectively when added to a verb root ending in a vowel. For example, root /pa-/ (to get) takes /-chch^h-/ and /-chch^{hi}-/ as progressive markers (in present and past tense) instead of /-ch^h-/ and /-ch^{hi}-. The same principle applies for cases in other persons. According to Lahiri (2000), the geminated form is the original shape that degeminates for verb roots ending in consonants. On the other hand, Bhattacharya (1993) mentions them just as variants. Here, Lahiri's view seems more tenable because with verb roots ending in consonants it is impossible to attach clusters like /-chch^h-/ and /-chch^{hi}-/ in pronunciation, because of which they eventually degeminate for verb roots with consonantal endings.

3.4.3.1 Phonological variation. Despite a considerable amount of linearity, one can find some irregularities in the inflected verb forms. This demands phonological explanation. Note that while adding the inflections for past simple, present perfect and past perfect, the verb root /k^ha-/ takes up an altered form /k^he-/, but remains the same for other situations. According to Lahiri (2000), the final sound in the verb root, /a/, interacts with the initial sound of the suffix and gets a compromised form. For example, when /k^ha-/ attaches the perfective aspect marker /-ech^h-, *k^haech^hi* becomes *k^heyech^hi*. If this is the case, one might wonder why the past simple form for 1st person should be *k^helam* and not *k^halam*, since the root /k^ha-/ is followed by the consonant /l/. Here the suggestion is that the past form was originally *k^hailam* in *Shadhu bhasha*, from where the present standard form (the then *Chalita bhasha*) has been derived. Therefore, such assimilation is not found when the root is followed by a consonant (present and past progressive forms), as expected.

Another form of assimilation has been put forth by Dasgupta (2007). He posits that such ‘vowel harmony’ in terms of the height dimension is predominant in Bangla. For example, root /ken/ (to buy) has the inflected form /kini/ (present simple for 1st person), which is motivated by the immediately following higher vowel /i/. For the same reason, the root /ken-/ does not alter in forms like *keno* and *kene*. But this account does not seem to explain the following forms *kinech^ho* (present perfective for 2nd person), *kinech^he* (present perfective for 3rd person), *kinch^he* (present progressive for 3rd person) etc. Here it must be borne in mind that these forms have been derived from *Shadhu bhasha* which originally were *kiniach^ho*, *kiniach^he* and *kinitech^he* respectively.

3.4.4 Scope of the discussion. It must be added here that Bangla verb forms also bear honorific markers. There are three inflections that mark honorifics in the 2nd person: /-o/ (neutral), /-en/ (formal) and /-ish/ (informal), and two in the 3rd person: /-e/ (informal and neutral) and /-en/ (formal). Unlike the neutral markers, the others mostly maintain the same form in the corresponding past forms. Table 3.2 presents the verb forms with different honorific markers.

However, the discussion on Bangla verb morphology presented in this chapter and the verb charts have not accommodated these variations purposely. This chapter presents Bangla only to the extent it might be relevant for explaining morphosyntactic development among Bangla-speaking children. Using appropriate honorific markers lies beyond a morphosyntactic level and it involves certain understanding at a pragmatic level. This knowledge may not be completely acquired by typically-developing children below age five and children with various language difficulties may also be unaware of this additional dimension. Also, unstructured observation indicates that in case of an absence of knowledge about the honorific forms, children use the neutral forms of the pronoun and the corresponding verb forms. This suggests that the neutral forms may have the status of the default forms in children's language. These considerations have led to restricting this study to neutral forms only. However, it is expected that in spontaneous language production some children will use other forms of pronouns and verb inflections as well.

Table 3.2

Bangla Honorific Markers on Verb Root /por-/ (to read)

Person/ Tense		Present tense		Past tense
2 nd person	intimate	simple	Tui boi porish . por-Ø- Ø- ish	Tui boi porli . por- Ø-l-i
		progressive	Tui boi porch^hish . por- ch ^h - Ø- ish	Tui boi porch^hili . por- ch ^h i-l-i
		perfective	Tui boi porech^hish . por- ech ^h - Ø- ish	Tui boi porech^hili . por- ech ^h i-l-i
	neutral	simple	Tumi boi poro . por- Ø- Ø- o	Tumi boi porle . por- Ø- l- e
		progressive	Tumi boi porch^ho . por- ch ^h - Ø- o	Tumi boi porch^hile . por- ch ^h i-l- e
		perfective	Tumi boi porech^ho . por- ech ^h - Ø- o	Tumi boi porech^hile . por- ech ^h i-l- e
	formal	simple	Apni boi poren . por- Ø- Ø- en	Apni boi porlen . por- Ø- l- en
		progressive	Apni boi porch^hen . por- ch ^h - Ø- en	Apni boi porch^hilen . por- ch ^h i-l- en
		perfect	Apni boi porech^hen . por- ech ^h - Ø- en	Apni boi porech^hilen . por- ech ^h i-l- en
3 rd person	neutral	simple	She boi pore . por- Ø- Ø- e	She boi porlo . por- Ø- l- o
		progressive	She boi porch^he . por- ch ^h - Ø- e	She boi porch^hilo . por- ch ^h i-l- o
		perfect	She boi porech^he . por- ech ^h - Ø- e	She boi porech^hilo . por- ech ^h i-l- o
	formal	simple	Tini boi poren . por- Ø- Ø- en	Tini boi porlen . por- Ø- l- en
		progressive	Tini boi porch^hen . por- ch ^h - Ø- en	Tini boi porch^hilen . por- ch ^h i-l- en
		perfect	Tini boi porech^hen . por- ech ^h - Ø- en	Tini boi porech^hilen . por- ech ^h i-l- en

Finally, the discussion on Bangla verb morphology concentrates on the simple base and the conjunct base verbs, and the finite forms only. Although some of the very commonly used and cognitively easy-to-understand Bangla verbs belong to the conjunct category, because

these verbs maintain the same principles and regularities of inflections, they have not been discussed separately. The other categories, i.e. the compound base verbs and the non-finite forms have been deliberately excluded with the purpose of keeping the breadth of the research manageable.

3.5 Verb Morphology in Colloquial Bangla

This colloquial variety, as mentioned before, is predominant in the Dhaka region and, provided a certain amount of exposure, it is understood by people all over Bangladesh. This form differs from the standard Bangla primarily with regard to its verbal inflections.

Table 3.3 presents an extended representation of the verbal inflections that incorporates the colloquial forms for the same roots /por-/ and /k^ha-/. As evident from the table, the colloquial inflectional system has the same person markers as the standard form with the exception of 2nd person marker in past contexts. The tense marking is retained without any alteration. But the main difference is in the aspect markers. These markers do not change for person, like their standard Bangla counterparts. However, they do have differences due to tense and aspectual information. The present and the past progressive markers are /-tes-/ and /-tesi-/, whereas their perfective counterparts are /-s-/ and /-si-/. These tense, person and aspect markers maintain a fair amount of uniformity with those from standard Bangla with regard to their sequence and the process of attaching to other members. Note that Table 3.2 does not contain the different person markers for honour because they are the same in both the language varieties.

Table 3.3

Representation of the Verbal Paradigm in the Standard and the Colloquial Bangla

Verb root 1 (ending in a consonant): /por-/ (to read)					
Verb root 2 (ending in a vowel): /kha-/ (to eat)					
	Present tense			Past tense	
	Standard	Colloquial		Standard	Colloquial
Simple	Ami boi pori . por- Ø- Ø-i	Ami boi pori . por- Ø- Ø-i	1 st person	Ami boi porlam . por- Ø- l-am	Ami boi porlam . por- Ø- l-am
	Ami k^hai . k ^h a- Ø- Ø-i	Ami k^hai . k ^h a- Ø- Ø-i		Ami k^helam . k ^h e- Ø- l-am	Ami k^helam . k ^h e- Ø- l-am
Prog	Ami boi porch^hi . por-ch ^h - Ø-i	Ami boi portesi . por-tes- Ø-i		Ami boi porch^hilam . por-ch ^h i- l-am	Ami boi portesilam . por-tesi-l-am
	Ami k^hachch^hi . k ^h a-chch ^h -Ø-i	Ami k^haite s <i>i</i> . k ^h ai-tes-Ø-i		Ami k^hachch^hilam . k ^h a-chch ^h i-l-am	Ami k^haite s <i>i</i> l <i>a</i> m. k ^h ai-tesi-l-am
Perf	Ami boi porech^hi . por-ech ^h - Ø-i	Ami boi por s <i>i</i> . por-s- Ø-i		Ami boi porech^hilam . por-ech ^h i- l-am	Ami boi por s <i>i</i> l <i>a</i> m. por-si-l-am
	Ami k^heyech^hi . k ^h e-ech ^h - Ø-i	Ami k^haisi . k ^h ai-s- Ø-i		Ami k^heyech^hilam . k ^h e-ech ^h i-l-am	Ami k^haisi l <i>a</i> m. k ^h ai-si-l-am
Simple	Tumi boi poro . por- Ø- Ø-o	Tumi boi poro . por- Ø- Ø-o	2 nd person	Tumi boi porle . por- Ø- l-e	Tumi por l <i>a</i> . por- Ø- l-a
	Tumi k^hao . k ^h a- Ø- Ø-o	Tumi k^hao . k ^h a- Ø- Ø-o		Tumi k^hele . k ^h e- Ø- l-e	Tumi k^haila . k ^h ai- Ø- l-a
Prog	Tumi boi porch^ho . por-ch ^h - Ø-o	Tumi boi porteso . por-tes- Ø-o		Tumi boi porch^hile . por-ch ^h i- l-e	Tumi boi portesila . por-tesi-l-a
	Tumi k^hachch^ho . k ^h a-chch ^h -Ø-o	Tumi k^haite s <i>o</i> . k ^h ai-tes- Ø-o		Tumi k^hachch^hile . k ^h a-chch ^h i-l-e	Tumi k^haite s <i>ila</i> . k ^h ai-tesi-l-a
Perf	Tumi boi porech^ho . por-ech ^h - Ø-o	Tumi boi por s <i>o</i> . por-s- Ø-o		Tumi boi porech^hile . por-ech ^h i- l-e	Tumi boi por s <i>ila</i> . por-si-l-a
	Tumi k^heyech^ho . k ^h e-ech ^h - Ø-o	Tumi k^haiso . k ^h ai-s- Ø-o		Tumi k^heyech^hile . k ^h e-ech ^h i-l-e	Tumi k^haisila . k ^h ai-si-l-a
Simple	She boi pore . por- Ø- Ø-e	She boi pore . por- Ø- Ø-e	3 rd person	She boi porlo . por- Ø- l-o	She boi porlo . por- Ø- l-o
	She k^hae . k ^h a- Ø- Ø-e	She k^hae . k ^h a- Ø- Ø-e		She k^helo . k ^h e- Ø- l-o	She k^hailo . k ^h ai- Ø- l-o
Prog	She boi porch^he . por- ch ^h - Ø-e	She boi portese . por-tes- Ø-e		She boi porch^hilo . por-ch ^h i- l-o	She boi portesilo . por-tesi-l-o
	She k^hachch^he . k ^h a-chch ^h -Ø-e	She k^haite s <i>e</i> . k ^h ai-tes- Ø-e		She k^hachch^hilo . k ^h a-chch ^h i-l-o	She k^haite s <i>ilo</i> . k ^h ai-tesi- l-o
Perf	She boi porech^he . por- ech ^h - Ø-e	She boi por s <i>e</i> . por-s- Ø-e		She boi porech^hilo . por-ech ^h i- l-o	She boi por s <i>ilo</i> . por-si- l-o
	She k^heyech^he . k ^h e-ech ^h - Ø-e	She k^haise . k ^h ai-s- Ø-e		She k^heyech^hilo . k ^h e-ech ^h i-l-o	She k^haisilo . k ^h ai-si- l-o

Here, it is worth mentioning that very often in the process of being inflected, the verb root /k^ha-/ changes to /k^hai-/. In fact, the additional /i/ could very well be part of the aspect following the root. Therefore, one could suggest that the aspect markers in colloquial Bangla are /-ites-/ and /-itesi-/ (present and past progressives respectively), and /-is-/ and /-isi-/ (present and past perfectives respectively). This pattern does not surface for verb roots ending in consonants. This asymmetry can be explained with reference to *Shadhu bhasha*. In that form, the inflected verb root /k^ha-/ has the following forms: *k^haitech^hi* and *k^haitech^hilam* (present and past progressive), and *k^haiyach^hi* and *k^haiyach^hilam* (present and past perfective). It is quite possible that these colloquial forms in question are motivated by *Shadhu bhasha*.

3.5.1 Rationale behind this section. The scope of the colloquial form is not as wide as the standard form. It is not used by everyone nor can it be used in every context. Although it is comprehended by most people in Bangladesh, SB is still more ubiquitous. However, the reference to this variety of Bangla is indispensable with regard to the present study, because the research entails communicating with very young children and eliciting language samples from them. If the child is exposed to the colloquial variety at home, it is likely for him/her to not be able to understand and produce the SB verb forms. Therefore, the research methods have taken the colloquial form into consideration and have had the right variety incorporated in the testing tools.

3.6 Implications for Acquisition Studies of Bangla

As described before, verb morphology in Bangla is characterised by regularity of suffixation and some degree of agglutination. Verbs, in finite contexts, typically contain tense,

aspect, person and honorific (not discussed here) markers, each attaching itself to the verb stem in a fixed order. Due to these embellishments, Bangla verbs can be regarded to be fairly rich. These morphological qualities of Bangla verbs present a fascinating case for language acquisition studies. Previously researchers studying both typical and atypical language development have gathered important findings with regard to agglutination and richness of the morphological paradigm. Children speaking morphologically rich languages have been reported to have relatively higher accuracy rates of verbal inflections than children speaking sparse languages (Aksu-Koç & Slobin, 1985, Turkish; Bedore & Leonard, 2001, Spanish; Bortolini, Caselli, & Leonard, 1997, Italian; Xanthos et al., 2011). Also, children's errors have been reported to manifest in a particular way in agglutinative and null-subject languages. Deviating from the target forms only by one feature, these errors have often been 'near-misses' (Bedore & Leonard, 2001; Lukács, Leonard, Kas, & Pléh, 2009). These properties, also found in Bangla, offer opportunities to evaluate the current proposals vis-à-vis Bangla child language. Very few studies have paid particular attention to exploring the nature of development displayed in Bangla or any structurally similar language (cf. Acarlar & Johnston, 2011, Turkish; Chakraborty & Leonard, 2012, Bangla). Therefore, Bangla verb morphology is thought to be of interest to researchers of children's early morphosyntax.

As found in studies conducted in other languages, verb inflections are expected to be challenging for both typically- and atypically-developing children speaking Bangla. Younger typically-developing children are expected to perform at a lower level than older typically-developing children. Children's level of performance is also expected to be governed by whether or not the child has any identified language difficulty. Within the verb inflections,

children may exhibit preference towards certain inflections. Since the study methods offer multiple opportunities for children to produce various combinations of different tense and the aspect markers, interesting patterns may emerge with regard to these markers. A noteworthy issue here is that the morphological paradigm in Bangla is fairly regular. Unlike fusional languages, Bangla inflections are typically coded for single morphological information and they are used consistently in various linguistic contexts. This is expected to result in more exposure of a certain item which may work in favour of children acquiring the language (Pinker, 1984). Therefore, the overall accuracy rates are likely to be fairly high.

The case of Bangla is also promising in terms of evaluating current proposals of language development. First of all, it is very likely that a stage of (Extended) Optional Infinitive (Wexler, 1994; Rice, Wexler & Cleave, 1995) will not be found for Bangla-speaking children. In other words, children's incomplete knowledge or inability to perform will not necessarily be evidenced from marking finiteness. Bangla tense markers examined in the study are brief and non-syllabic whereas there are some aspect markers that are monosyllabic or disyllabic. This may make aspect markers more salient and therefore easy to the young users. If this is the case, then the surface hypothesis (Leonard, 1989) will be reinforced by Bangla data. Finally, the Bangla data are expected to support the account based on morphological richness (Leonard, 2014a). Bangla has a relatively rich morphological paradigm where verb stems rarely occur in isolation. Verb stems are accompanied by person markers almost compulsorily which take aspect and tense markers in addition as demanded by contexts. It is anticipated that the high degree of morphological richness will have a significant effect on children's performance. As also predicted by the same account, children's errors are expected to be non-target finite forms

and not bare forms as claimed in the Extended Optional Infinitive hypothesis. Therefore, it can be concluded that due to its unique set of properties, Bangla is in a distinct position to shed light on some of the existing theories and the present study aims at attaining some of the first insights of Bangla child language.

Chapter Four

The Pilot Study

The present study is one of the first on morphosyntactic development of Bangla-speaking children. Therefore, although it had a set of specific goals to achieve, it was also exploratory to a great extent. In order to conduct the study, testing tools needed to be identified and designed to suit the young participants. The testing schemes also needed to be trialled to determine their appropriateness and effectiveness in a new setting. Therefore, a pilot study was considered essential for a better understanding of the issues involved. The pilot study was conducted from June 2012 to August 2012 in Dhaka, Bangladesh.

Experimental tasks as well as the use of spontaneous language samples were reported in the literature to have successfully answered questions about children's language development with each technique having its specific benefits. Therefore, it was decided that to examine the development of verb inflections, i.e. the tense, aspect and person markers, specific probes would be employed, and to obtain a general measure of children's language development their spontaneous language samples would be collected.

4.1 Aims

The purpose of the pilot study was to ensure some key parameters for the study proper. The pilot study was designed to provide feedback in the following areas:

- a) if the linguistic areas targeted for testing in the actual study were developmentally sensitive, and feasible for investigation

- b) if the testing tools were appropriate and friendly enough for children, and if the tools were easily manageable
- c) if the age group targeted was useful

4.2 Participants

The pilot study was aimed at executing the tests on a young Bangla-speaking population. With this goal, 19 typically-developing children (one child tested twice with an interval of three months) between age three (\pm three months) to age four (\pm three months) were recruited to participate in the study. Parents of the children were informally interviewed and they filled out a questionnaire with information about the child and his/her language behaviour. This was designed so that children with any medical condition or speech, language and hearing difficulty (reported by parents) could be excluded from the pilot study. One of the children (2;7) initially recruited appeared to lag behind in linguistic achievements compared to his age-matched peers. He spoke very little and in words, not sentences. The parent expressed concerns about his language development and therefore the child was not included in the study. The parent was suggested that the child be tested by a speech-language expert in order to learn about any special conditions.

In order to understand the target competence of a native Bangla speaker, the revised method (described later) was also executed with seven Bangla-speaking adults living in Bangladesh. Their ages ranged from 21 years to 65 years.

Table 4.1

Age Profile of Children

	Mean (N= 20)	Standard Deviation	Range (Maximum- Minimum)
Age (in months)	37.60	8.68	28 (53- 25)

4.3 Tests and Procedures

In acquisition studies on a variety of languages, Leonard and his colleagues used language probes extensively to elicit the target inflections (Bangla: Chakraborty & Leonard, 2012; Chinese: Fletcher, Leonard, Stokes, & Wong, 2005; Finnish: Kunnari et al., 2011; Hungarian: Leonard, Lukács, & Kas, 2011). They created contexts that warranted obligatory production of the target inflections with the help of pictures, toys or puppets, and through enactment. A fixed set of stems were consistently used in all the contexts to examine the development of the target inflections. Such production probes designed to assess children's language development were reported to be highly effective when a predetermined set of inflections were to be tested.

Following Leonard and his colleagues' probes, elicitation tasks were designed for the pilot study that were executed with a cross-sectional sample of children. The pilot study also included a set of sentence imitation tasks and a spontaneous language sample from each child. The tests were specifically aimed at eliciting verb inflections, i.e. tense, aspect and person markers.

4.3.1 Sentence repetition task. A sentence repetition test was administered to the participants. A repetition test was designed that consisted of the target inflections presented in 45 sentences. The test contained grammatical sentences in Bangla that employed verbal conjugations containing the present progressive, present perfective, past simple, past progressive, past perfective, and the first, second and the third person markers. Thirty sentences targeted the production of the five tense-aspect conjugations (5X6), and 15 sentences targeted the three person markers (3X5). The sentences in Bangla contained six to twelve morphemes each. Some of the sentences used were:

- a) Truckta garitake dori diye tanch^he. (The truck is pulling the car with a rope.)
- b) Lokta kechi diye kapor katch^hilo. (The man was cutting a cloth with (a pair of) scissors.)
- c) Ami nanur shathe majhemajhe phone e kotha boli. (I talk to grandma on the phone sometimes.)

As per instructions given, children were shown a stuffed toy (Teddy) and were told that ‘Teddy can’t hear very well. So when I tell him something, can you say it again so that Teddy can hear it?’

4.3.2 Sentence elicitation task. A set of sentence elicitation tasks was executed with the participants. Situations were demonstrated using age-appropriate toys, in response to which the children were expected to produce sentences. These target situations demanded that the children produce sentences involving the use of tense, aspect and person inflections with verbs.

The test to elicit the five tense-aspect forms contained 30 items (5X6) and the set for the three person markers contained 15 items (3X5).

In order to elicit the target forms, different contexts were created with the help of playdough and culturally-appropriate stuffed toys. The present progressive forms were elicited by showing a toy performing some actions and by asking children what the toy was doing. Children were expected to say, 'Teddy is dancing/walking.' In order to elicit the present perfect form, the toy was shown to do an action which later stopped. After that children were asked, 'What has Teddy done?' Children were expected to say, 'Teddy has danced/walked.' For the past progressive forms, the toy was shown to do an action which got interrupted. This was followed by a question from the examiner 'What was Teddy doing?'. Correct answers required children to say, 'Teddy was dancing/walking.' In the simple past situation, the toy was shown to be doing an action. After stopping that action, children were told, 'Now he is not walking anymore/ Now the dance is over. What did he do?' Children needed to say, 'He danced/walked.' There was a time lapse at this stage when free-play happened between the child and the examiner. This was required to set up the past perfect situation. After the brief play session, the examiner and the child returned to the toy and the child was told, 'Oh Teddy is so tired! What had he done?' Children were expected to say, 'He had danced/walked'. These situations were repeated for all the selected verbs.

The person marker task engaged the parent as well. Children were asked, 'Now let's play a game. Can you do the things Teddy has done? I can do some of them. Look, I am dancing. Can you do anything else?' After children demonstrated an action, they were asked, 'What are

you doing?’ The children were expected to say, ‘I am flying/walking’. Then actions were demonstrated by the examiner and the parent, and children were expected to say, ‘You are flying/walking’ and ‘Mom/Dad is flying/walking’. This continued till utterances were elicited for all selected verbs in all three forms.

Three criteria guided the selection of the verbs. They had to be demonstrable in the elicitation or repetition. The verbs were all early-emerging according to the Cross Linguistic lexical Norms (<http://www.cdi-cllex.org>) and they all translated to simple base (one-word) verbs in Bangla.

4.3.3 Language samples. In addition to the two production tasks, language samples were collected from the participants to gather an overview of their language performance in conversational speech and to confirm the language skills displayed in the elicitation and repetition tasks. Language samples emerged mainly from conversation and free-play between the examiner and the child which were often aided by the child’s books and toys.

4.4 General Information about the Set-up

The tests were conducted in the children’s homes with the participation of their parents. Due to the breadth of the tests, it was decided that the tests would be conducted in two visits. Each test employed live-voice. The sentence repetition and the sentence elicitation test were presented in blocks in order to avoid fatigue. All sessions were video recorded using the video option of a digital camera, Canon Powershot S5IS. The language samples were, subsequently, transcribed by the researcher for analysis of the markers.

4.5 Scoring

For the sentence repetition and the sentence elicitation tests, each utterance with correct inflections was credited. The use of wrong inflections in the target words (verbs) was scored as incorrect. However, errors in other words of sentences were ignored for scoring purposes.

For the language samples, the number of obligatory contexts for each target inflection was calculated, and the actual production of those inflections was counted from the transcription for each child. Every correctly inflected form was given credit, and any deviation, i.e. absence of the inflection or substitution by other inflected forms, was counted as an error.

4.6 Responses of Participants

One of the primary reasons why an extensive pilot study was conducted with the target population was to receive feedback on the research instruments. In this respect the pilot study was enlightening, because useful feedback came from children's responses.

4.6.1 Sentence repetition task. The sentence repetition task had 45 sentences containing the target language items. Due to the length of the task, it was difficult to hold children's attention for the entire time. Also, the children tended to drop certain markers in the repetition task which were correctly produced in the elicitation task and the language sample. Therefore, arriving at conclusions with regard to accuracy of the grammatical markers based on these responses did not seem convincing.

4.6.2 Sentence elicitation task. The elicitation tasks varied in usefulness. Sometimes it was possible to elicit the target sentences through the task. However, some probes did not elicit the desired response. For example, after responding to six actions in progression (e.g. What is Dolly doing? -> Dolly is dancing.) when the children saw that the doll had completed the action and were asked 'What has dolly done?', they replied 'Dolly is walking.' This could have been a reflection of children's lack of comprehension; however, the instructions for this task employed the Present Perfect structure of which children showed good comprehension and production skills in the language samples. Therefore, it appeared that the elicitation task may have captured a compromised picture of the children's language performance. Secondly, it was difficult to communicate the situations for the past progressive and the past perfect to children below age three. Finally, the task was too lengthy and it was not possible to have the children attend for that long.

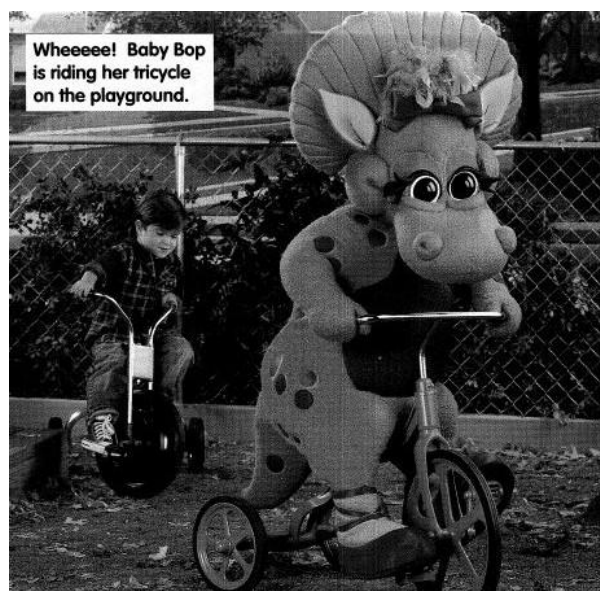
4.6.3 Spontaneous language samples. Collecting samples of children's language use through play sessions did not pose many obstacles and it seemed to be a feasible method for capturing the natural language performance of very young children.

4.7 Modifications and the New Method

The previous design showed that languages samples could be obtained more efficiently by engaging in talk with the children rather than through the elicitation or repetition tasks. However, collecting spontaneous language samples from children also had pitfalls. Having a conversation that was not controlled for language items ran the risk of obtaining a large amount of 'irrelevant' language. Therefore, a combination of structured probes and

spontaneous language samples seemed an effective method to serve the purpose of the research. Also, general feedback emerging from the current design of the study was that the tasks were very long with all the contrasts of the markers, which made it inappropriate for use with very young children. Since the study proper was to be conducted on a larger scale with children of the same age group, the length of the study needed to be adjusted. With this information, the set of tasks designed to elicit person markers were removed.

The revised method employed conversations with children in five situations. These situations were designed to control the language to be produced by the children. These contexts were shaped to elicit responses containing five target verb forms: present progressive, present perfect, past simple, past progressive and past perfect.



Figures 4.1 and 4.2. Sample pictures used to elicit the Present Progressive form

- **Present progressive.** Children were shown a picture book (Bernthal & Full, 2006) with pictures of Bop (a cartoon character) and his friends doing some actions in school such as riding bicycles, making sand castles, playing with tea sets, and singing. The children were asked what those characters were doing in the pictures (Figures 4.1 and 4.2).
- **Present perfect.** Children were asked what they had done since morning. In Bangla the present perfect form seems a more natural choice than the past simple to use in this situation. The expected responses were such as ‘I have brushed my teeth’, ‘I have played with mummy’.
- **Past simple.** Children were asked to tell a story they knew. Narrative is one mode which typically employs past simple constructions in Bangla.
- **Past progressive.** To elicit responses bearing the past progressive forms, children were told about the examiner’s visit to a zoo. They were told at the time of the visit, different animals were doing different things. For some animals, sentences were left incomplete and children were asked ‘Can you say what the tiger was doing’. Children were expected to respond in sentences like ‘The tiger was sleeping’ and ‘The cow was eating grass’.
- **Past perfect.** Children were asked about their visit to a restaurant or an amusement park, or how they celebrated a festival. The expected responses were such as ‘We had ridden the toy train there’ and ‘We had eaten lots of sweets’.

A group of seven adults were also invited to do the same tasks in order to identify the extent to which children's language errors were due not to their ages, but to language input and usage. However, these adults were not family members of the children who participated in the study.

4.8 Results

Table 4.2 presents a general reflection of children's success with the target forms. Raw scores were calculated in percentage. The results indicated that the present perfect form was acquired with highest mastery by children. Unlike in English (Brown, 1973), the Bangla present progressive form was not one of the forms used by children early on. In addition, the children had low accuracy rates in the past progressive and the past perfect forms, as anticipated. Using these forms meaningfully has some cognitive prerequisites, the result of which may be reflected in the low scores.

Table 4.2

Descriptive Statistics of Children's Accuracy (%) on Tasks (N= 20)

	Mean	Standard Deviation	Range (Maximum-Minimum)
Present Progressive	66.87	29.70	92.86 (100-7.14)
Present Perfect	92.79	9.85	27.78 (100-72.22)
Past Simple	54.66	37.52	100 (100-0)
Past Progressive	23.99	33.48	83.33 (83.33-0)
Past Perfect	27.97	31.66	100 (100-0)

4.8.1 Present progressive. Bangla permits production of the present simple form in place of the present progressive in day-to-day conversation. Therefore, this pattern of

substitution was expected in children's language too. Most of the substitutions for the present progressive forms were their present simple counterparts. However, this pattern was not restricted to any particular age group. Parents were also found to often structure sentences in the present simple form to very young children (observed with parents of the twin children of 2;1 years). Therefore, it is possible that children learn to mark progression a little later. However, the fact that they continued to do this even at an older age was probably not due to the late emergence but to the flexibility permitted in the language. This was not the case for the adults except for one; the adults did not replace the progressive with the simple form, when stimuli were given in progressive forms. Figure 4.3 presents children's performance on the Present progressive task.

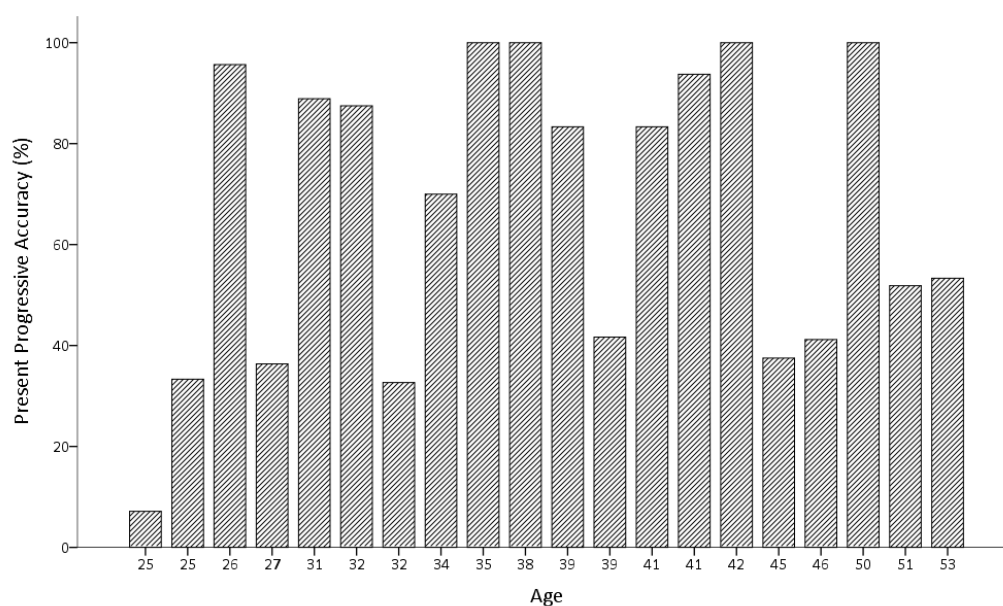


Figure 4.3. Percent accuracy in the Present Progressive form

4.8.2 Present perfect. The mean accuracy of the present perfect form was over 92% for the children tested. Nevertheless, there were some substitutions. Some older children (3;9 and 4;5) replaced the target form with the past progressive or the past perfect form. Analysis of the inaccuracies made by younger children (2;2 and 2;3) showed a different pattern. These children produced the aspect markers correctly, but combined them with inappropriate person markers. Figure 4.4 demonstrates children's accuracy in the present perfect form.

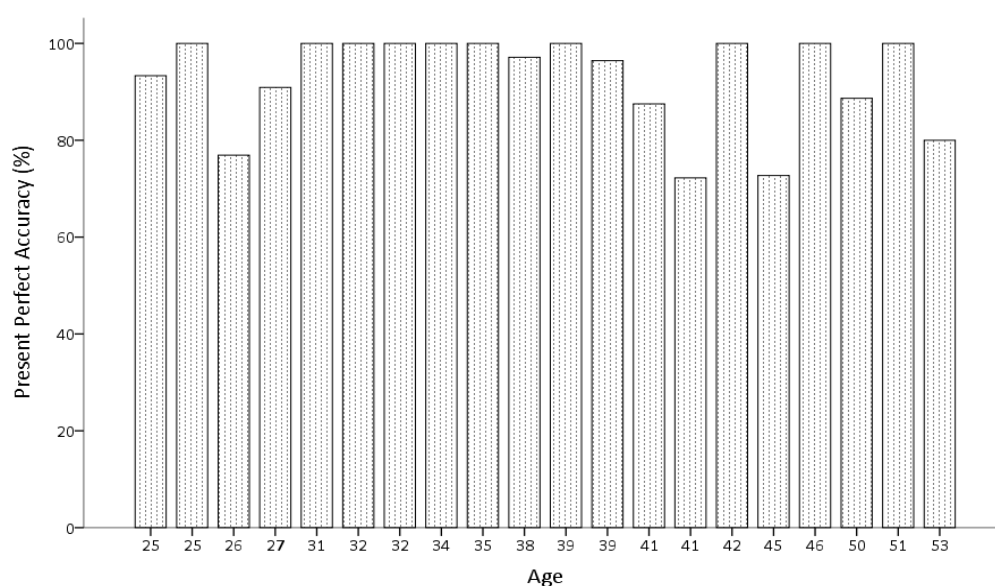


Figure 4.4. Percent accuracy in the Present Perfect form

4.8.3 Past simple. Children's performance on the past simple showed a consistent pattern. It was widely substituted with the present perfect counterpart by children as well as adults (when tested). Figure 4.5 contains children's scores on the past simple task.

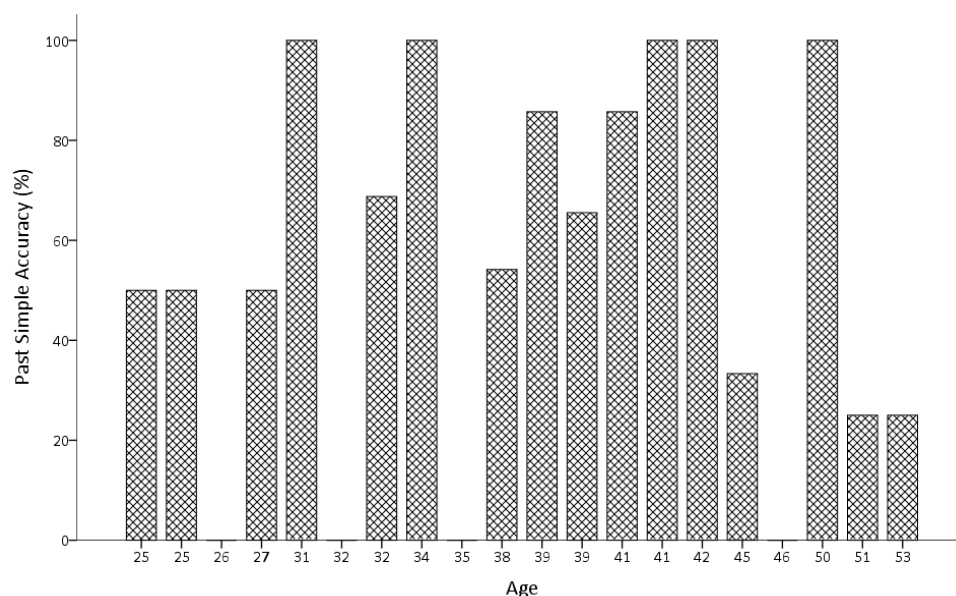


Figure 4.5. Percent accuracy in the Past Simple form

4.8.4 Past progressive. The task to elicit this form required listening to and comprehending a story and completing the story with utterances containing the present progressive form. Due to task demands it was difficult to communicate the situation to most children below 2;6. But the older children showed increasingly better responses. A common substitute was the present progressive form. Children's accuracy scores can be found in Figure 4.6.

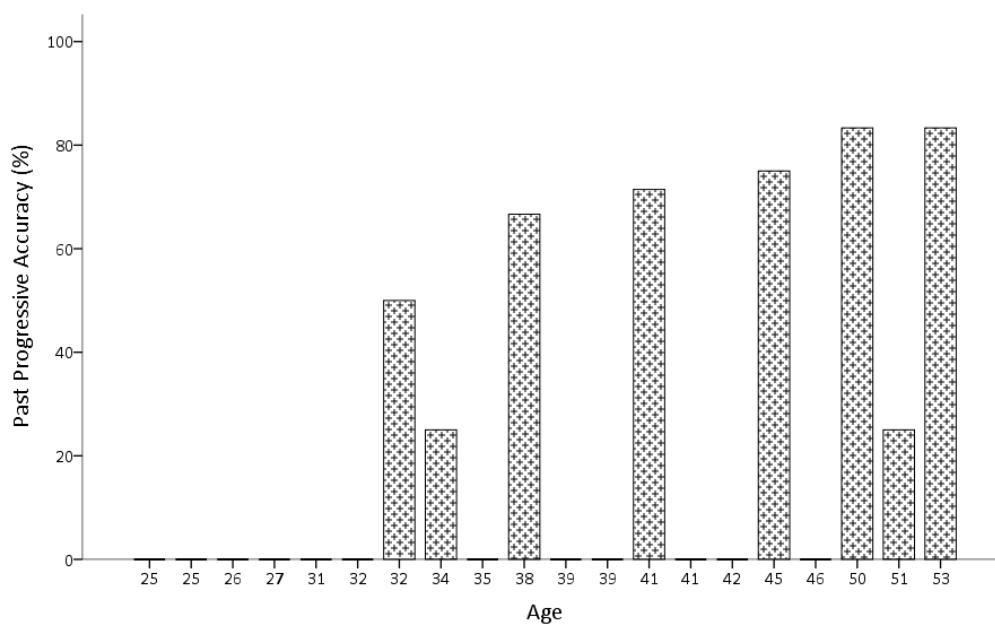


Figure 4.6. Percent accuracy in the Past Progressive form

4.8.5 Past perfect. The overall accuracy in this task was very low (Mean= 27.97). Only two children (3;2 and 4;2) scored above 70% and eight of the twenty children had no success at all. This form was commonly replaced by the present perfect form. Figure 4.7 shows children's performance on this task.

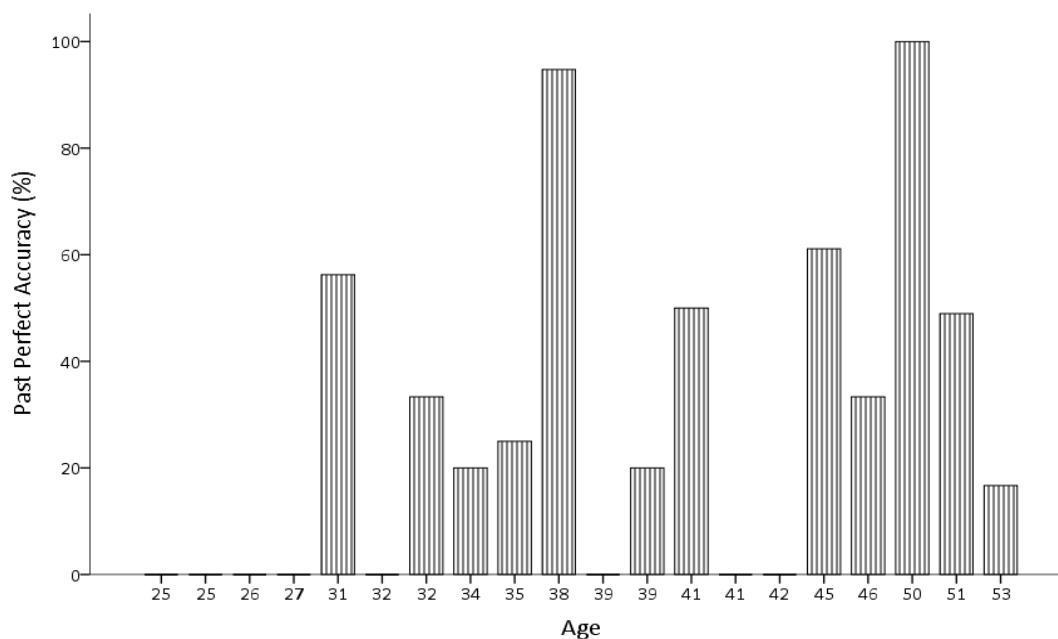


Figure 4.7. Percent accuracy in the Past Perfect form

4.9 Discussion on Verb Inflections

Based on the data some preliminary judgements can be made about the markers. Unlike English, overt progressive marking on verbs is probably not the earliest linguistic skill of a Bangla-speaking child. On the other hand, present perfect forms seemed to be a child's strength from a very early age. One reason why the present perfect form is relatively accurate from an early age (as opposed to the present progressive form) may be the use of the form in the past simple and the past perfect contexts, whereas positive evidence for the present progressive form is reduced by use of the present simple in present progressive contexts. Also, it is noteworthy that in most cases, the substitute form is structurally simpler than the target form.

Children's performance on the past progressive form appeared to be informative. However, not all children in the target age group could participate in the task considering the cognitive demand it posed. It is very likely that the task was at a higher developmental level than some of the children were and their apparent failure at the task was largely due to their inability to comprehend it. Leonard, Caselli and Devescovi (2002) reported a similar issue with their set of probes for Italian verb inflections.

Performance on past simple and past perfect forms is intriguing, but it may not be wise to make any judgement on the development of these markers from this set of tasks and results. It emerged from children's responses that the past simple form was difficult to strictly elicit through probes because the present perfect form was the most natural choice in a general past context. On the other hand, it seemed that the past perfect form was warranted only when there were references to more than one action in a past context.

4.10 Additional Analysis

In addition to examining the rate of accuracy of the target grammatical markers and how they developed over time, children's use of verb types was also measured. This measure was calculated from all of the conversational samples.

As described in Chapter 3, verbs in Bangla are of three kinds: 1) simple verbs: expressed in one word; for example, *porch^{hi}* (por-ch^h-i)-> (I am) reading. 2) conjunct verbs: expressed with a light verb and a nominal entity; for example, *ranna korch^{hi}* (rannakor-ch^h-i) --> (I am) doing cooking. 3) Compound verbs: expressed with two verbs: the main verb (the primary source of meaning) attaches an infinite (/ -e/) marker and is followed by another 'light' verb that bears the

finiteness marker and the other inflections; for example, *bole phelech^hi* (bol-e phel-ech^h-i) --> (I have) completed saying. For calculating verb types, the verbs bearing the target markers were calculated. For example, in the cases of 'doing cooking' and 'completing saying' the verbs 'do' and 'complete' were counted. However, the latter case is complex, because the Bangla verb used here to express 'completion' literally means 'dropping'.

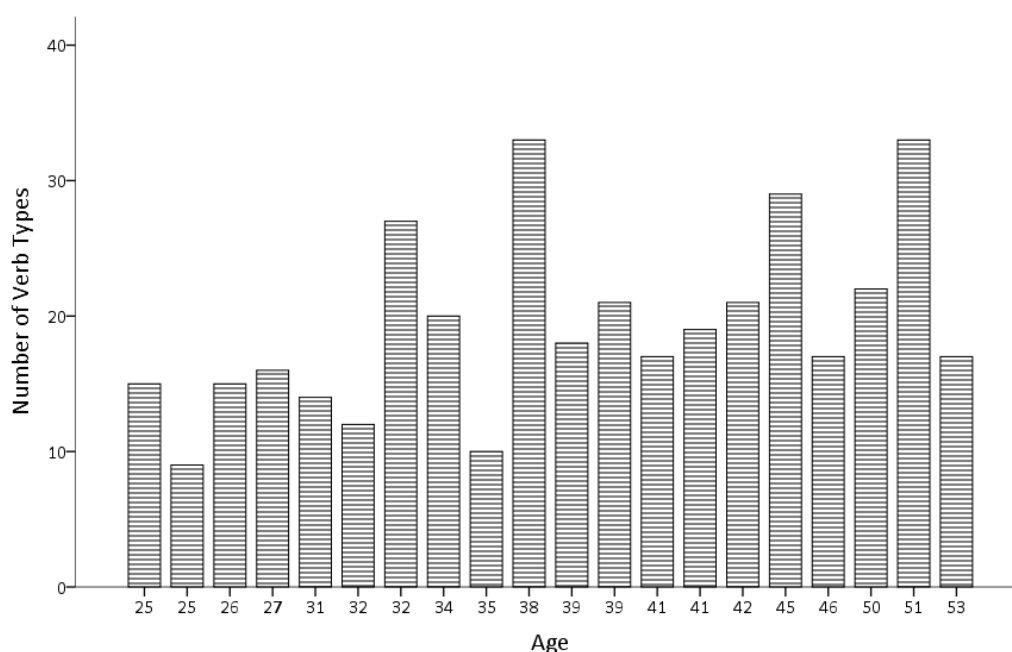


Figure 4.8. Number of verb types produced by children

The results presented in Figure 4.8 are difficult to interpret mainly because the length of the language sample was not uniform. When the pilot study was designed, the primary purpose was to examine accuracy. So, the duration of the conversation was mainly regulated by the number of occurrence for the target markers, i.e. the conversations were terminated when the experimenter felt that there were enough attempts at each target marker. So, these counts of verb types are not representative of a child's ability. For example, older children finished the tasks early, which resulted in production of fewer word types. However, it was noted from this

analysis that in the actual study word type measure would need to be examined in relation to children's other language measures.

4.11 Refinements and Discussion

Based on children's responses to the tasks, the experience with the testing instruments, and the data obtained, some refinements were made to the methods for the main study. These are described below.

1. The situational tasks in the pilot study were not controlled for the number of opportunities for each target marker. As a result, some markers had very limited opportunities, especially with very young children. For example, if there were only two opportunities for a marker and the child produced one correctly, it might not be reasonable to conclude that the child had 50% accuracy for that marker. Therefore, it was decided that at least a certain number of opportunities would be ensured for each marker.
2. The situations used in the pilot study were designed primarily to generate the target tense and aspect marker combinations. Hence the responses yielded were sometimes in the first person and sometimes in the third person. The situations were refined for the actual study so that all the responses generated a single person marker.
3. A major finding of the pilot study was that all the target verb forms did not lend themselves to being tested with two-year-olds. One of the primary purposes of this pilot study was to ensure the feasibility of the tests in the target context. The study was successful in terms of making such revelations about some of the target markers. Unlike English, use of the Bangla past simple forms is rather random. Situations that necessitate production of the

past simple forms in Bangla are rare. The pilot study employed a story-telling situation, because, in storybooks, narratives typically contain this form. But the pilot study revealed that 1) story-telling as a task did not succeed with very young children; 2) very young children often told stories with the exact expressions used in the book which did not reveal their linguistic skills; and 3) while telling stories children commonly replaced the past simple form with the present perfect. Substitution of the past simple form by the present perfect was also common among the group of adults in this study. These findings indicated that a story-telling situation was inappropriate for the current study. More importantly, the observation that the past simple form often was replaced by its present perfect counterpart in oral communication questioned the decision of including the past simple form in the present study.

While designing the elicitation tasks for the past perfect forms, time was considered to be the only defining factor. Therefore, situations that required children to talk about something that happened in the remote past were considered a fit for the study. But the pilot study revealed that the use of past perfect in Bangla also depended on whether or not the impact of the referred action still held; for example, 'Why did you dirty the floor? I *had mopped* it a while ago.' Also, unlike the other situations discussed before, the past perfect contexts warrant the understanding of three different points in time: speaking time, event time and reference time, which is demanding for the two-year-olds. Aksu-Koc and Slobin (1985) made a similar suggestion about the emergence of different past inflections. They found that children's acquisition of different past markers was governed by the markers' relative cognitive complexity. They reported that the past inflection that stood for an

immediately-observable change was acquired before the form referring to a general past event, and the past marker for witnessed past events was acquired before the form for non-witnessed past events. This suggests that for Bangla the past perfect form is likely to be a later-emerging marker.

Therefore, considering the feasibility and the demands of the tasks, it was decided that the past simple and the past perfect forms would not be included in the main study.

4. Results of the present perfect task revealed that the children had very high accuracy scores on this form. This was consistent with the finding that this form was often used by children as a substitute of other verb forms marking past events, i.e. the past simple and the past perfect forms. Therefore, it was anticipated that a task eliciting the present perfect form might not be adequately informative. This led to a decision that this form would not be included in the main study.
5. The pilot study showed that in unstructured conversations one of the most frequent verb forms used was the present simple construction. This gave rise to the idea that it might be useful to include this as a target form in the study proper. The present simple form in Bangla does not take any overt tense and aspect marker; it is only marked for person. So it might present a good test case to be compared against the other verb forms that take more inflections. Considering these issues, it was decided that the present simple form would also be among the target verb forms, and situations would be devised to elicit this form.

6. The structured conversation used in the pilot study for eliciting the past progressive forms revealed that children below age three were often not able to respond to the situation. This could partly be due to children at that age not being cognitively mature enough to process such a situation. If this is the case, then we can expect that the past progressive form will be available to children only beyond age three. Therefore, it was decided that the task would be revised by employing some pairs of pictures depicting different actions with which the target forms would be elicited. Another important reason for changing the context was the possibility that children might produce the same verb for different situations. For example, when asked, 'What was the monkey doing?' and 'What was the tiger doing?', children might respond with 'It was sleeping' in both situations. A set of questions guided by unique picture pairs would be free from such overlap.
7. The main study was aimed not only at identifying children's language development with regard to different morphological markers; it also aimed to evaluate other measures of language development, for example, mean length of utterance (MLU), count of word type (controlled for sample length), and use of bound morphemes in verbs. Structured conversations were not considered ideal for calculating these measures, since those conversations were primarily shaped to achieve other goals. Therefore, it was decided that a 20-minute language sample would be included in the main study, in addition to the structured conversations and the elicitation tasks.

A complete description of the study is presented in the following chapter.

Chapter Five

Methodology: Main Study

5.1 Aims

The broad aim of this study was to identify some specific properties of morphosyntactic development among Bangla-speaking pre-school children and to extend the results by determining how children with Specific Language Impairment (SLI) fare in building their linguistic knowledge. The study assessed children's performance in producing particular verb inflections, i.e. tense and aspect marker combinations used in the present simple, the present progressive and the past progressive forms. The research questions were:

1. What is the developmental route for acquiring the selected verb inflections in Bangla?
2. Is MLU more strongly related to language abilities (demonstrated in the test scores) than Age?
3. Is the performance of the children with SLI on the verb inflections significantly different from their younger typically-developing peers?

5.2 Participants

There were 70 typically-developing children between age 23 months (1;11 years) and 51 months (4;3 years), 33 boys and 37 girls. These children were recruited from six daycare centres and pre-schools in Dhaka, Bangladesh. Once ethical approval had been obtained from the Human Ethics Committee of the University of Canterbury, the daycare centres/ pre-schools were approached to invite their participation. Once approval from the organisations was

obtained, parents were invited to take part in the study (see section 5.4). Along with a consent form, each parent filled out a questionnaire that provided information about his/her child. The inclusion of children in the ‘typical’ group was largely based on parental reports in response to questions like ‘*Do you have any concern about your child’s speech, language or hearing*’ and ‘*Has anyone in your family had a speech or language delay or disorder*’ (see the complete questionnaire in Appendix A). Another inclusionary criterion was children’s exposure to only one language i.e. Bangla. These children heard some amount of Hindi (on television) and English within the first four years of their lives. However, parents confirmed on the questionnaire that those children had minimal exposures to the other languages, i.e. children sometimes heard words and phrases in non-Bangla languages.

Table 5.1

Typically-developing Children’s Profile

	Number of participants	Mean	SD
Age (23 to 35 months)	31	30.03	3.43
Age (36 to 47 months)	32	40.78	3.82
Age (48 months and above)	7	50.14	.90
Overall Age (Min 23 - Max 51 months)	70	36.96	7.6
Mother's education (Min 9- Max 20 years)	70	15.49	2.73

Four of the six daycare centres operated as part of four companies and they cared for children of employees from all levels of the company. Therefore, although the group recruited for the study was not deliberately representative of the Bangla-speaking population, it was a diverse group with children belonging to low to high socioeconomic backgrounds. Table 5.1 presents a general profile of the typically-developing group.

As mentioned previously, the second aim of the study was to identify the characteristics of morphological development of the children with SLI. However, to date there has been no method for identifying children with SLI in Bangladesh. This was anticipated given the fact that there were no normative data or any assessment tools for examining Bangla development. Given this, it was decided that a group of children with a range of developmental disorders, including those with an array of cognitive difficulties, could be included in the study to obtain a general view of language impairment in Bangla. Also, the literature on an array of language difficulties suggested that there was a remarkable overlap in the morphosyntactic profiles of children affected by different developmental challenges (Laws & Bishop, 2003; Mawhood, Howlin, & Rutter, 2000). So, if the present group with language impairment (LI) was found to perform poorly on the verb markers, then this attribute was potentially challenging for children with SLI.

Therefore, the LI group consisted of nine children with language impairment who had been clinically diagnosed to have at least one difficulty from an array of cognitive challenges. Their age ranged from 3;11 to 9;4 years. These children were recruited from a special school in Dhaka, Bangladesh. As mentioned for the typically-developing (TD) group, approval was

obtained from the organisation first and then from the parents of each child. Table 5.2 summarises the children in this group and also some clinical information obtained from their school.

Table 5.2

Clinical Profile of the Children with LI

Child No.	Age (yrs)	Sex	Diagnosed to have	Diagnosed by	Test used to assess
1	5;3	Boy	Developmental delay	School/ Child Psychologist	Bayley's Scales of Infant Development
2	8;4	Boy	Developmental delay/Mild Autism	School/ Child Neurologist	
3	8;6	Girl	Down's Syndrome	Neonatologist	Chromosomal Analysis
4	8;5	Boy	Intellectual Disorder	School/ Child Psychologist	
5	9;4	Boy	Autism Spectrum Disorder	Child Neurology Clinic (DMCH)	Modified Checklist for Autism in Toddlers (MChat)
6	8;1	Boy	Cognitive/ Developmental Delay	School/ Child Neurologist	-
7	3;11	Girl	Speech & Communication Delay	School/ Child Neurologist	-
8	7;7	Boy	ADHD/ ASD	School/ Child Neurologist	-
9	6;8	Boy	Mild Autism	School/ Child Psychologist	-

The recruitment of these children largely relied on the preliminary assessments made by the experts in the school (e.g. the speech and language therapists) and on the reports from the clinical practitioners. In the absence of a language-specific testing tool, these children were not assessed on their linguistic knowledge before recruitment. However, it was ensured by speaking to the school coordinator that these children were able to at least combine words. These limitations in recruitment once again emphasise the need for conducting a study such as this in the context of Bangladesh.

5.3 Tasks

Three language production tasks were designed to elicit three different verb conjugations in an experimental format, and a 20-minute language sample was collected to obtain a spontaneous sample of their language that could be used to yield information on children's overall language skills. Two of the verb forms, the Present Progressive and the Past Progressive, were elicited using pictures and the Present Simple form was elicited through a semi-structured conversation. The tasks are described in detail below.

It is noteworthy that all of the language tasks were designed to elicit responses in the third person form, i.e. all the stimuli required children to respond using third person agents. The justification for this came from an observation made during the pilot study that the sessions would be too long to manage for the participants if all person markers were tested. Therefore, the person dimension had to be dispensed with as far as the experimental tasks were concerned. However, it was possible to observe the children's performance on the person

markers from their language samples, and to measure and comment on the range and accuracy of use of these forms.

5.3.1 Structured conversation. The task was designed in a way that required children to respond using present simple structures. The experimenter engaged in a conversation with the participant about the daily activities of the family members. Stimuli were questions such as *'What does mummy do in the kitchen?', 'What does granny do in the morning?'* etc.

Since it was a conversation and was only loosely structured, questions to ask sometimes arose from children's previous responses and they were determined by the nature of the family. If there were domestic helpers employed in the house, questions about his/her activities were more likely to successfully generate desired responses. In addition, since the responses came from the participants, the individual verbs elicited could not be controlled. Also, the length of the conversation varied widely (7 to 37 utterances); the scope of the conversation was limited with very young children and therefore fewer verbs emerged from these interactions. Children who were able to produce at least six responses (tokens) were entered into the analysis. Based on this criterion, four children were removed from the analysis.

Two sentences modeling the target forms were presented at the beginning of the conversation. This was used as an ice-breaker which in addition provided a framework for the children to build their responses on.

5.3.2 Picture book task. A picture book was used to elicit present progressive forms from the children. A book of the cartoon character Barney titled *Let's Go to School* (Bernthal & Full, 2006) was used in this task. The book contained the story of Baby Bop going to school

where she and her friends were shown to be engaging in some activities (Figures 4.1 and 4.2). Ten pictures were chosen from the book and children were asked questions like ‘*What is Bop doing here?*’, ‘*What are her friends doing?*’ etc. The pictures were chosen based on three criteria. Firstly, the picture had to depict an action using a verb that was one of the earliest emerging in children’s vocabulary. There was no list available for Bangla in particular. Hence confirmation was obtained from English and other languages as published on the website of Cross Linguistic Lexical Norm study (<http://www.cdi-clex.org>). Secondly, a native speaker (experimenter) judged whether or not the Bangla counterparts of the identified verbs were common in Bangla. Finally, only the ten verbs that could be unambiguously identified from the pictures were chosen for the task. However, since the task aimed to test children’s knowledge of the inflections and not the verbs themselves, if children supplied verb stems other than the target items, they were not considered in error as long as the inflections were correctly produced. A detailed description of the scoring criteria follows in section 5.5 below.

To demonstrate the task requirements, two practice pictures (not part of the 10 selected pictures) were first described by the experimenter using the present progressive form. Children were then asked questions based on some of the following pictures. A full list of picture stimuli used in this task can be found in Appendix B.

5.3.3 Paired picture task. An experimental task was designed using a set of picture pairs to elicit past progressive forms. The first picture of each pair depicted a person or an animal sleeping and the other picture showed the same person or animal doing an action such as eating, running or cooking. Showing the first picture the experimenter told the child in Bangla,

'Look, the boy is sleeping here. He is sleeping because he is very tired. Do you know why he is tired? Because he was doing something a while ago. Can you say what he was doing?' At this point the second picture was introduced. Looking at the picture, children were expected to say what the person was doing before (Figure 5.1).



Figure 5.1. A picture pair used in the Past Progressive task

There were 10 picture pairs to elicit 10 verbs in their past progressive forms. As with the picture-book task, the selection of verbs was guided by the data summarised from the Cross Linguistic Lexical Norm study (<http://www.cdi-clex.org>). In addition, the Bangla equivalent of these verbs listed on the website needed to be commonly used. Finally, the verbs needed to be demonstrable through pictures so that children could identify the actions. However, as with the present progressive task, children were credited if they supplied the past progressive inflections correctly, even with a different verb stem.

As practice, children were shown two pairs of pictures and were told the corresponding stories before they were asked to respond. The complete set of pictures used in the task is in Appendix C.

5.3.4 Language sample. Apart from the experimental tasks, the study design also included sampling children's language performance. In order to assess children's overall spontaneous language abilities, it was important to obtain some conventional measures of their performance. These assessments were reported to be typically made on a representative and unbiased body of children's language production. These measures could not be validly obtained from structured conversations because those tasks were designed for other objectives. In order to have a picture of children's language ability as it was deployed in spontaneous conversations, language sampling has been advocated (Eisenbeiss, 2009, 2010; Klee, 1985).

The length of the sample was a crucial decision that needed to be made. Although some researchers found short samples to be reliable enough (Heilmann, Nockerts, & Miller, 2010), Gavin and Giles (1996) stated that stable representation required longer samples (≥ 175 complete and intelligible utterances). The purpose of including language samples in the study was to provide a general picture of children's language abilities. Therefore, the samples needed to be representative of children's real-life language use. Hence, it was decided that a 20-minute language sample would be collected from each child (cf. Klee, Stokes, Wong, Fletcher, & Gavin, 2004).

Language samples were based on a play session between each child and the experimenter. A session between the child and his/her parent would have been ideal in this

situation since it would have captured the nature of input to which these children were exposed. However, parents were not available to participate since the data were collected at daycare centres/ preschools. An advantage of the examiner's participation in the play was that a consistent input could be ensured during the play session.

Each child played with the same set of toys. The toy set consisted of a doll's house, a cooking set, a toy car and some puppets. Everything was bought from the local toy shops to ensure that children were familiar with the objects.

5.4 Procedure

The testing took place in the respective daycare centres/ preschools of the children. A separate room was allocated by each organisation for the testing sessions. The rooms were adequately bright. In some of the places noise could not completely be controlled. However, the recording instruments were sophisticated enough to collect audible responses from the children, and unintelligibility was not a concern while transcribing or scoring the data. A representation of the data collection setting can be found in Appendix D.

Approval was obtained from the organization at the outset because they not only had to give permission but also needed to make some adjustments to their daily schedules to accommodate the sessions. Once this was done, individual parents were given the study's information sheet, consent form and a questionnaire. After receiving the completed documents from the interested parents, the experimenter contacted them by telephone to ask a further set of informal questions. As described above, the present simple task required the researcher

to mention children's family members in the conversation. Information needed for this was collected from the parents during the telephone conversation.

All the tasks and the freeplay for each child were completed within an hour. However, due to compliance issues with some very young children, the session had to be spread over two days. In each case, the second session took place within three days of the first session. All of the sessions were both audio- and video-recorded. The audio recorder was wirelessly connected to a microphone which was attached to the child's attire. The video-recording was done using a Canon Powershot S5IS camera. The video-recording was important to obtain the extralinguistic information available in the context. These recordings were generally used for scoring since the sound quality of the video was very good. The audio-recordings were referred to only in cases of ambiguity. All the equipment was solely handled by the experimenter herself.

In a regular one-hour session the order of the assessments was kept constant. The session opened with the present simple structured conversation which was then followed by the present progressive task, the past progressive task and the language sample. The order was not randomly selected. Activities that involved more toys and were presumably more exciting, i.e. the free-play session for spontaneous language samples, were deliberately administered towards the end since it might be difficult to engage children into conversation after they had played with the toys. Therefore, it was carefully planned to begin with the conversation and to save the most interesting task for the end.

5.5 Scoring

Scoring criteria were set by the researcher and the tasks and the language samples were also coded by her. The scoring criteria used for each task were determined by the nature of the task.

5.5.1 Present simple task

1. Children were asked questions that required them to answer using the present simple form. These opportunities were counted and scores were calculated in percent correct. There was no minimum or maximum possible score as the forms were generated in conversation.
2. No responses, use of other markers, nonfinite utterances, and utterances without verbs (where verbs were expected) were considered errors.
3. In the conversation, if the stimuli did not model the target form, and children made an error in the form, that entire stimuli-response unit was excluded from the sample. For example,

Examiner: Hridoy bhaiya ki kore?

Hridoy brother what does

What does brother Hridoy do?

Child: (no response)

Examiner: Ar Shumi apu?

and Shumi sister

And sister Shumi?

Child: Bashay.

at home

At home.

In the example above, the second question and answer sequence was excluded since the question itself did not contain any verb.

4. If a section of the child's responses appeared to be anecdotal (for instance, the child talked about a visit to the shopping mall) and it contained a non-target form, children were not penalized and that utterance/section was excluded from calculation. The justification for this was that references to past events would naturally prompt past inflections and therefore children would rightly produce forms other than the present simple.
5. The task was structured as a conversation and children occasionally began talking before the examiner. If a child's incorrect production preceded the examiner's model sentences, i.e. if children had not heard even one statement in the target form by then, that utterance was excluded from the analysis.

5.5.2 Present and past progressive tasks

1. There were 10 picture stimuli for each of the present and past progressive tasks. Scores were calculated in percent correct.
2. If children's errors were followed by a correct response through self-correction, the utterance was considered accurate.

3. In cases where verb stems were unclear, children were given credit as long as the markers were clear and one could be sure of the presence of the inflections in the utterance. However, it was decided that such utterances would be excluded if any analysis was to be made on verb types.
4. Correct inflections with non-target stems were given credit when calculating accuracy.
5. Responses with posture verbs (standing, sleeping) were disregarded because structurally they are expressed differently in Bangla.
6. Children's utterances preceding the stimuli (containing the target structure) that resulted in incorrect forms were disregarded, unless those questions were asked by the examiner again and children produced a second response.
7. Utterances with the target phrases imitated from the examiner's speech were excluded. However for calculating the accuracy of markers, children were given credit if there was a change in form (standard to colloquial or vice versa) while repeating the phrases.
8. 'No responses' were considered to be a marker of inability; hence children were penalized for those.

5.5.3 Language sample. Children's spontaneous language was transliterated using the Roman alphabet. Since both Bangla and English use a postpositional inflection system, the SALT (Systematic Analysis of Language Transcripts) version (Miller, Gillon, & Westerveld, 2012) for English data did not require major adjustments to arrange for Bangla analyses. The issue of the agglutinative properties in the verb morphology was addressed by adding multiple inflectional suffixes separated by slashes (/). The transcription manual prepared by Klee (2010) was followed for general guidelines on SALT transcriptions. Children's utterances were coded only

at the morphological level. Substitution or distortion of phonemes was ignored. The scoring criteria and the SALT conventions used for the Bangla language samples were:

1. Since the present simple form is permissible in Bangla to function as the present progressive form, such use was not considered erroneous in the language samples. However, they were considered incorrect in the elicitation tasks, because children then were primed with the present progressive forms, and if a child knew that form he/she was expected to respond using that form.
2. If an error was repeated in the immediate next sentence, it was entered and coded as an error. However, it was coded as a maze so that the repetition did not affect the scores.
3. Errors of commission were expressed using SALT flags [], since there was no existing convention in SALT for this.
4. Substitutions were marked with an asterisk mark (*) for omission and a flag [FLAG] for commission.
5. Customary expressions were considered as one unit and written as single words, i.e. *thikase* (It's alright), *thankyou*, *eije* (Here/ There you go).
6. Compound words (or semi-compounds words) were transcribed as one word. The assumption here was that children were not likely to have enough linguistic exposure to be able to view them as analysed items.
7. Substitution or distortion of phonemes was not noted.

8. Wrong forms, such as a wrong vowel alteration (/Dhaka dao/ instead of /dhekhe dao/), were not marked incorrect since they did not involve any of the target morphemes. However, they were noted separately for future analysis.
9. Inappropriate grammatical forms that required explanation were flagged with [WF], i.e. Wrong Form.
10. Idiosyncrasies in terms of pronunciation were ignored.

5.6 Reliability

An inter-rater reliability check was conducted to judge the accuracy of transcription of the language samples. As mentioned previously, the transcription of language samples to be used later in the software Systematic Analysis of Language Transcripts (SALT) (Miller, Gillon, & Westerveld, 2012) was the transliteration of the Bangla utterances into Roman script. In order to obtain reliability measures, conventional calculations were used (Fletcher, Leonard, Stokes, & Wong, 2005; Lustigman, 2012; Rice et al., 2010). Over 20% of the data, from 13 children, was transcribed independently by a second transcriber who was not involved in the study in any other capacity. No deliberate sampling criteria were employed to select the files to be transcribed by a second transcriber. In order to complete the reliability transcriptions early enough so that they could be received by the end of the overall data collection, soon after the first set of language samples were recorded, 13 files were given to the second transcriber. The second transcriber, a linguistics graduate and a first language speaker of Bangla, was informally trained for the task by the experimenter. She also read the transcription manual (Klee, 2010) as a preparation for the transcription. She was given the video and the audiotapes of the children

from which she only transcribed the utterances without coding them. Coding and scoring decisions were made by the researcher alone and the second transcriber was not aware of them. Consensus was obtained between the two transcribers about how to use the Roman script for Bengali sounds consistently.

Point-to-point inter-rater agreement was measured from the language samples at the morphemic level. Two measures were calculated from the transcripts: point-to-point agreement in morphemes and point-to-point agreement in utterance boundary. Scores were separately calculated for the utterances of children and the examiner. To calculate the agreement in morphemes, each morpheme was compared in the two transcripts of each child and any disagreement in morphemes was noted. Percent agreement was achieved by dividing the number of agreements by the number of total morphemes and multiplying the score by 100. If the target morpheme was noted as unintelligible in any of the transcripts, it was excluded from comparison. Since calculation was done separately for the child and for the examiner, corresponding scores were used. For instance, to calculate the reliability measures in a child's data, the number of agreements and number of total morphemes in the child's utterances were considered only.

Agreement in utterance boundary was measured to find out if there was uniformity between the transcribers in identifying the utterances. Since the study reported MLU scores, it was important to examine how reliably the utterance boundaries were identified. In order to calculate the agreement scores, each utterance was compared in the two transcripts. Differences in marking the utterances were noted. However, disagreements in morphemes

were overlooked since that was reported in the morpheme agreement scores. Following the procedure described for morphemes, percentage value of agreement in utterance boundary was calculated separately for the child and the examiner.

Inter-rater agreement scores revealed satisfactory overlap between the two transcriber's work. There was 97.89% and 99.74% agreement in morphemes in children's and examiner's utterances respectively. There was 97.43% and 95.46% agreement in utterance boundary for children and for the examiner respectively.

5.7 Analysis

All analyses were conducted using IBM SPSS Statistics 20.0 (IBM Corporation, 2011) and Systematic Analysis of Language Transcripts (SALT-NZ) (Miller, Gillon, & Westerveld, 2012). Primary analyses on children's accuracy in the three target forms were calculated in percentage instead of raw scores. Because the present simple task was a semi-structured conversation, the number of responses varied across children. Therefore, raw scores needed to be converted into percentages. Although the target items were uniform in the present progressive and the past progressive tasks, the same was done for these scores too for compatibility. Descriptive statistics (Mean, SD and Range) were generated from the percentage scores.

In order to identify the factors determining the performance of the typically-developing children, bivariate and partial correlation analyses were conducted. Simple regression and hierarchical multiple regression analyses were run to identify the best predictor of their performance. Also based on their accuracy and error types, the typically-developing children were grouped using the two-step cluster analysis. Group differences were confirmed by running

a series of one-way ANOVAs. Finally, a repeated measures ANOVA was conducted to compare the degree of accuracy among the three groups on the three tests.

Similar analyses were run on the data of the children with language difficulties. In addition, a discriminant function analysis was conducted for all children in order to compare performance of the LI group with the sub-groups of the TD children (identified from the cluster analysis).

Results obtained by running these analyses are presented in the following chapter.

Chapter 6

Findings: Typically-developing Children

The chapter presents a detailed analysis of children's use of three morphological verb markers in Bangla; the Present Simple, the Present Progressive and the Past Progressive. The findings reported here were obtained from 70 typically-developing children between 23 and 51 months of age using a set of three experimental tasks and a spontaneous language sample conducted between each child and the researcher. However, 64 children's data were entered for analyses since the responses of the other children were incomplete (five children: 2;3, 2;11, 3;0, 3;1, 4;2 years) or could not be scored/ transcribed reliably (one child: 2;0 years).

6.1 Language Sample Measures

A twenty-minute language sample was generated from a freeplay session between each child and the examiner, which was later transcribed using the computer program the Systematic Analysis of Language Transcripts (SALT) (Miller, Gillon, & Westerveld, 2012). In order to obtain an overall view of children's language abilities, especially in terms of their morphosyntactic skills, conventional measures such as Mean Length of Utterance (MLU), Total Number of Utterances (TNU), Total Number of Words (TNW) and Number of Different Word Types were generated from the language samples. An additional measure, Bound Morpheme Type (BMT), was calculated from the language samples as an index of children's knowledge of morphemes. BMT or number of different bound morphemes produced by the children was calculated from the transcripts in SALT. This measure was inspired from the hypothesis that

high-performing children not only have more words (types) in their repertoire, their language also contains a greater variety of bound morphemes. More proficient children are likely to use some bound morphemes that have not been mastered by less-proficient children yet.

Table 6.1

Measures Derived from Children's Language Samples (N = 64)

	Range (Min- Max)	Mean	SD
Age (month)	28 (23- 51)	37.16	7.49
MLU	2.97 (2.12- 5.09)	3.73	.75
MLUadj	3.37 (3.53- 6.90)	5.03	.78
TNU	265 (61- 326)	189.47	60.19
TNW	806 (110- 916)	437.66	170.56
Number of word types	162 (33- 195)	110.34	35.88
TBM	591 (66- 657)	279.80	121.34
BMT	22 (12- 34)	24.81	5.59

Note. MLU = Mean length of utterance, MLUadj = Adjusted mean length of utterance, TNU = Total number of utterances, TNW = Total number of words, TBM = Total bound morphemes, BMT = Bound morpheme types.

Although MLU is reported widely in the literature of child language acquisition, it is also known to be affected by conversational and contextual factors (Chapman, 1981; Johnston, 2001; Johnston, Miller, Tallal, & Curtiss, 1993; Klee, 1992). To minimize these effects, an alternative MLU was calculated excluding one-word and imitated utterances (both self-imitation and imitation of the interlocutor). This was termed Adjusted MLU (MLUadj). However, in this population MLU and MLUadj were highly correlated ($r_{(64)} = .90$, $p < .001$). Still the fact that

MLU is affected by the number of yes-no responses and imitated utterances meant that MLUadj was considered to be a better reflection of children's expressive language skills and therefore, this measure was used in the following analyses, rather than MLU. Table 6.1 displays a range of language measures calculated from children's language samples.

6.2 Test Scores

One of the main objectives of the study was to assess children's mastery of the three verb forms, i.e. the Present Simple, the Present Progressive, and the Past Progressive, and identify the developmental route for Bangla-speaking typically developing children vis-à-vis these forms. Children's proficiency in the three target verb forms was examined on three experimental tasks. Since the number of target sentences varied across the tasks, percent accuracy scores were calculated for each task.

6.2.1 Descriptive statistics. Table 6.2 presents the descriptive scores for children's accuracy with the three forms. The Present Simple form was used with the highest accuracy (88%), whereas the accuracy rates were considerably lower for both the Present Progressive (67%) and the Past Progressive forms (44%).

Table 6.2

Accuracy (percentage) on the Tests (N= 64)

	Range (Min- Max)	Mean	SD
Present Simple	93.75 (6.25- 100)	88.33	19.96
Present Progressive	100 (0- 100)	67.19	31.75
Past Progressive	100 (0- 100)	43.59	41.23

A one-way repeated measures ANOVA was performed to determine if the levels of accuracy were different across the three verb forms, which could possibly lead to the interpretation that these verb forms were available to children at different developmental stages. The results showed that children's performances on the three tasks were significantly different from each other ($F_{(1.75, 110.38)} = 53.14, p < .001, \text{partial } \eta^2 = .46$). In other words, these forms were found distinct in terms of the level of challenge they posed for children. Therefore, it can be proposed that the Present Simple is the first among the three forms to be acquired which is followed by the Present Progressive form, and finally the Past Progressive form is added to children's language system. This issue will be further analysed in a following section.

Figure 6.1 shows a composite picture of children's success on the three tasks. The horizontal axis presents individual children, and children's accuracy rates (%) on the three tasks are presented on the vertical axis. Since the figure displays composite scores, children's accuracy rates may range from 0 (0 X 3) to 300 (100 X 3). As indicated in Table 6.2, the figure displays that there was a degree of difference in children's use of the three forms; some children used a high amount of the Present Simple form, some used the Present Simple and the Present Progressive forms, and some children (clustering on the right side of the graph) used all three forms with high accuracy. There were 23 children (36%) in this population who scored zero in the Past Progressive task. On the other hand, only three children (4.69%) had a score of zero in the Present Progressive task, and no child scored zero in the Present Simple task. Moreover, the accuracy rate of the children scoring zero in the Past Progressive task was very high in the Present Simple task ($M = 73.69, SD = 27.18$) and moderate in the Present Progressive task ($M = 44.78, SD = 33.96$). As indicated by the descriptive statistics of the task scores (Table

6.2), the Past Progressive form appeared to be the most difficult among the three forms.

Interestingly, when the children are arranged according to their Past Progressive scores (Figure 6.1), there is an overall incline on the right side which suggests that these linguistic skills are inter-related, i.e. the accuracy of one form (e.g. Past Progressive) was associated with the accuracy of the other forms (e.g. Present Simple and the Present Progressive forms).

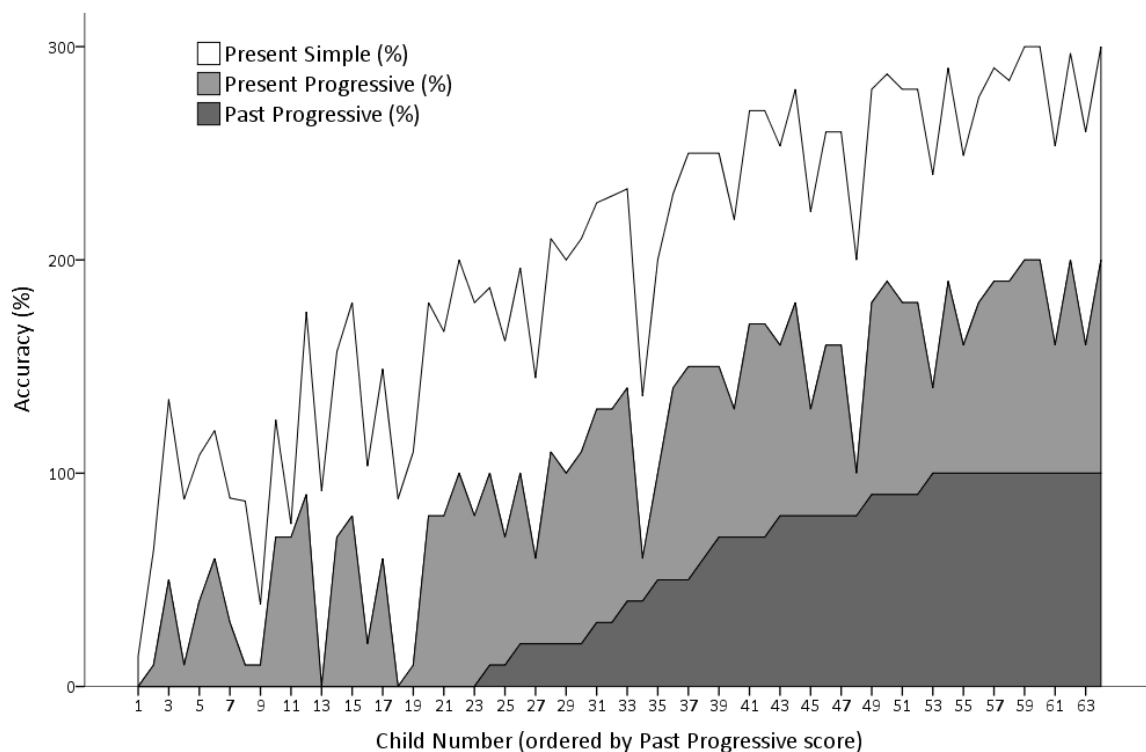


Figure 6.1. Children's composite performance on the tasks

6.3 Determinants of Test Scores

One of the specific goals of the study was to examine the contribution of Age and MLU to children's performance on the morphological markers. In order to determine if these

variables were associated with the test scores, a set of correlation and regression analyses were performed.

6.3.1 Correlation analysis. Correlation analysis was performed to explore the relationship between Age or MLUadj, and children's scores on the three tasks. The analysis was run using Pearson's statistics. Table 6.3 displays the correlation coefficients among the variables obtained from the analysis. Child age in months was found to be strongly correlated with all the test scores. The correlation analysis also revealed a significant relationship between MLUadj and the test scores. However, in this population Age was found to have a stronger association with the test scores (except for the PastProg) than MLUadj.

Table 6.3

Correlation Coefficients among the Variables (N = 64)

	PS	PresProg	PastProg	Age	MLUadj	BMT
PS	-					
PresProg	.50	-				
PastProg	.48	.45	-			
Age	.58	.51	.51	-		
MLUadj	.48	.50	.53	.57	-	
BMT	.58	.56	.53	.62	.63	-

Note. All coefficients are significant at $p < .001$.

As presented in Table 6.3, Age and MLUadj are related variables ($r = .57$, $p < .001$). Therefore, Age being correlated with the task scores was also likely to be due to its association with MLUadj, and vice versa. A pair of partial correlation analyses was performed to examine if Age and MLUadj were independently associated with the test scores. The results of the partial

correlation analyses are presented in Table 6.4. The partial correlation results revealed that, beyond the effect of MLUadj, Age had a significant moderate relationship with all the test scores. When the effect of Age was removed, MLUadj had a significant relationship with the Present Progressive and the Past progressive scores, but not with the Present Simple scores.

Table 6.4

Results of the Partial Correlation Analyses

	PS	PresProg	PastProg
Age (MLUadj partialled out)	$r = .42^{**}$	$r = .32^*$	$r = .30^*$
MLUadj (Age partialled out)	$r = .23$	$r = .30^*$	$r = .34^{**}$

* $p < .05$. ** $p < .01$.

The relationship between Bound Morpheme Type (BMT), a relatively less-explored measure, and the test scores was also examined. At $p < .001$ level, BMT was found to be strongly correlated with the test scores (Table 6.3). Note that this relationship is stronger or similar to those yielded by Age or MLUadj. The relationship between BMT and the test scores, independent of Age and MLUadj, was examined by performing a partial correlation analysis. Even when the effect of both Age and MLUadj were removed, BMT remained significantly correlated with the Present Simple ($r = .29$, $p = .022$) and the Present Progressive ($r = .27$, $p = .032$) scores. The relationship with the Past Progressive scores was not statistically significant ($r = .20$, $p > .05$).

Age, MLUadj and BMT were also inter-related. At $p < .001$ level, all three variables were found strongly associated with the other determinant variables (Table 6.3).

6.3.2 Regression analysis. In order to determine if Age, MLUadj, or BMT contributed to the task scores, a set of regression analyses was performed. In other words, the regression analyses were performed to determine if the task scores could be predicted as functions of the predictor variables. For this analysis, the predictors were entered separately as independent variables, and each test score was entered as an outcome variable. Tables 6.5-6.7 contain the results of the regression analyses on the three outcome variables.

Table 6.5

Regression Analysis for the Present Simple Scores (N = 64)

Separate regressions		Unstandardised B	Unstandardised SE B	Standardised β
1	Constant	31.36	10.48	
	Age	1.53	.28	.58***
2	Constant	26.20	14.53	
	MLUadj	12.35	2.86	.48***
3	Constant	36.76	9.37	
	BMT	2.08	.37	.58***

*** $p < .001$.

The regression with Age as the predictor of the Present Simple scores was significant ($F_{(1, 62)} = 30.71$, $p < .001$). Age was a significant predictor of the Present Simple scores, accounting for 33% of the variance in the test scores, which reflected in the R^2 value. MLUadj was also a significant predictor of the Present Simple test scores ($F_{(1, 62)} = 18.73$, $p < .001$), accounting for

23% of the variance in the outcome variable. The third model, with BMT as the predictor, was also statistically significant ($F_{(1, 62)} = 31.81, p < .001$), accounting for 34% of the variance in the test scores.

Table 6.6

Regression Analysis for the Present Progressive Scores (N = 64)

Separate regressions		Unstandardised B	Unstandardised SE B	Standardised β
1	Constant	-13.27	17.53	
	Age	2.17	.46	.51***
2	Constant	-35.84	22.80	
	MLUadj	20.48	4.48	.50***
3	Constant	-11.87	15.17	
	BMT	3.19	.60	.56***

*** $p < .001$.

Age was a significant predictor of the Present Progressive scores ($F_{(1, 62)} = 21.92, p < .001$), accounting for 26% of the variance in the test scores. MLUadj was a significant predictor of the Present Progressive scores ($F_{(1, 62)} = 20.91, p < .001$) with 25% of the variance in the Present Progressive scores explained by the MLUadj. BMT was also a significant indicator of the Present Progressive scores ($F_{(1, 62)} = 28.51, p < .001$), with 32% of the variance accounted for by the BMT.

Table 6.7

Regression Analysis for the Past Progressive Scores (N = 64)

Separate regressions		Unstandardised B	Unstandardised SE B	Standardised β
1	Constant	-60.57	22.79	
	Age	2.80	.60	.51***
2	Constant	-98.27	28.98	
	MLUadj	28.21	5.69	.53***
3	Constant	-53.44	20.18	
	BMT	3.91	.79	.53***

***p < .001.

The regression analysis revealed that Age was a good predictor of the Past Progressive task scores ($F_{(1, 62)} = 21.74$, $p < .001$), with 26% of the variance explained by the Age. MLUadj also accounted for a considerable amount of the variance (28%), ($F_{(1, 62)} = 24.53$, $p < .001$). BMT was a significant predictor of the Past Progressive scores ($F_{(1, 62)} = 24.27$, $p < .001$), accounting for 28% of the variance in the task scores.

All of the predictors were able to account for large amounts of variance in the test scores with Age and BMT being stronger predictors than MLUadj (Tables 6.5 - 6.7). However, it was likely, given the correlation results, that there would be a significant amount of shared variance. Therefore, a hierarchical multiple regression analysis was run to identify any unique variance accounted for by the predictors. A three-step hierarchical multiple regression analysis was run for each outcome variable. In Block 1 only MLUadj was entered as a predictor; in Block 2 Age was included as an additional predictor; in Block 3 BMT was entered with the existing two variables. The order of the variables was dictated by the predictive power of the factors

revealed from a linear regression analysis reported above. In other words, the relatively weakest predictor was entered first and the strongest was entered last.

Table 6.8

Results of Hierarchical Regression Analysis for Present Simple Scores (N = 64)

	B	SE B	β	R^2	ΔR^2
Block 1				.23***	.23***
Constant	26.20	14.53			
MLUadj	12.35	2.86	.48***		
Block 2				.37***	.13**
Constant	15.03	13.67			
MLUadj	5.80	3.19	.23		
Age	1.19	.33	.45**		
Block 3				.42***	.05*
Constant	15.79	13.20			
MLUadj	2.38	3.41	.09		
Age	.86	.35	.32*		
BMT	1.16	.50	.33*		

*** $p < .001$. ** $p < .01$. * $p < .05$.

The hierarchical regression model for the Present Simple scores showed that Age added to MLUadj as a predictor was able to account for an additional 13% variance in the Present Simple test scores (Table 6.8). As indexed by the R^2 value of .37 ($p < .001$), the regression model was significant. When a third predictor, BMT, was added in the regression model, it still accounted for a unique 5% of variance in Present Simple scores.

Table 6.9

Results of Hierarchical Regression Analysis for Present Progressive Scores

	B	SE B	β	R^2	ΔR^2
Block 1				.25***	.25***
Constant	-35.84	22.80			
MLUadj	20.48	4.48	.50***		
Block 2				.33***	.07*
Constant	-49.08	22.40			
MLUadj	12.71	5.23	.31*		
Age	1.41	.54	.33*		
Block 3				.38***	.05*
Constant	-47.91	21.74			
MLUadj	7.44	5.61	.18		
Age	.89	.58	.21		
BMT	1.79	.82	.32*		

***p < .001. ** p < .01. *p < .05.

In the regression model for the Present Progressive scores, Age accounted for a unique 7% of the variance beyond the amount explained by MLUadj (Table 6.9). As indicated by the R^2 value, the model was statistically significant. Finally, adding BMT into the regression model showed that the third predictor was also crucial; it accounted for an extra 5% of variance in the dependent variable.

Table 6.10

Results of Hierarchical Regression Analysis for Past Progressive Scores

	B	SE B	β	R^2	ΔR^2
Block 1				.28***	.28***
Constant	-98.27	28.98			
MLUadj	28.21	5.69	.53***		
Block 2				.35***	.06*
Constant	-114.01	28.67			
MLUadj	18.97	6.70	.36**		
Age	1.67	.70	.30*		
Block 3				.37***	.03
Constant	-112.89	28.32			
MLUadj	13.96	7.31	.26		
Age	1.19	.75	.22		
BMT	1.70	1.06	.23		

***p < .001. ** p < .01. *p < .05.

The regression model for the Past Progressive scores revealed that Age as a unique predictor added 6% to the variance already accounted for by MLUadj only (Table 6.10). BMT, entered as a third predictor, was not found to contribute significantly as a unique predictor of variance in the Past progressive scores. In other words, BMT did not account for a significant amount of additional variance in the Past Progressive test scores beyond the amount already explained by MLUadj and Age. However, as indicated in Table 6.10, the overall model was statistically significant.

6.4 Error Analysis

Children's responses elicited from the three production tasks were used not only to obtain the accuracy rates; they were also analysed to identify the error patterns. It was anticipated that children's errors would reveal developmental characteristics deemed interesting for linguistic investigations. This section reports the nature of errors produced by the children on the three tasks. An examination of children's errors indicated what they knew and their preferences when the target form was not available to them.

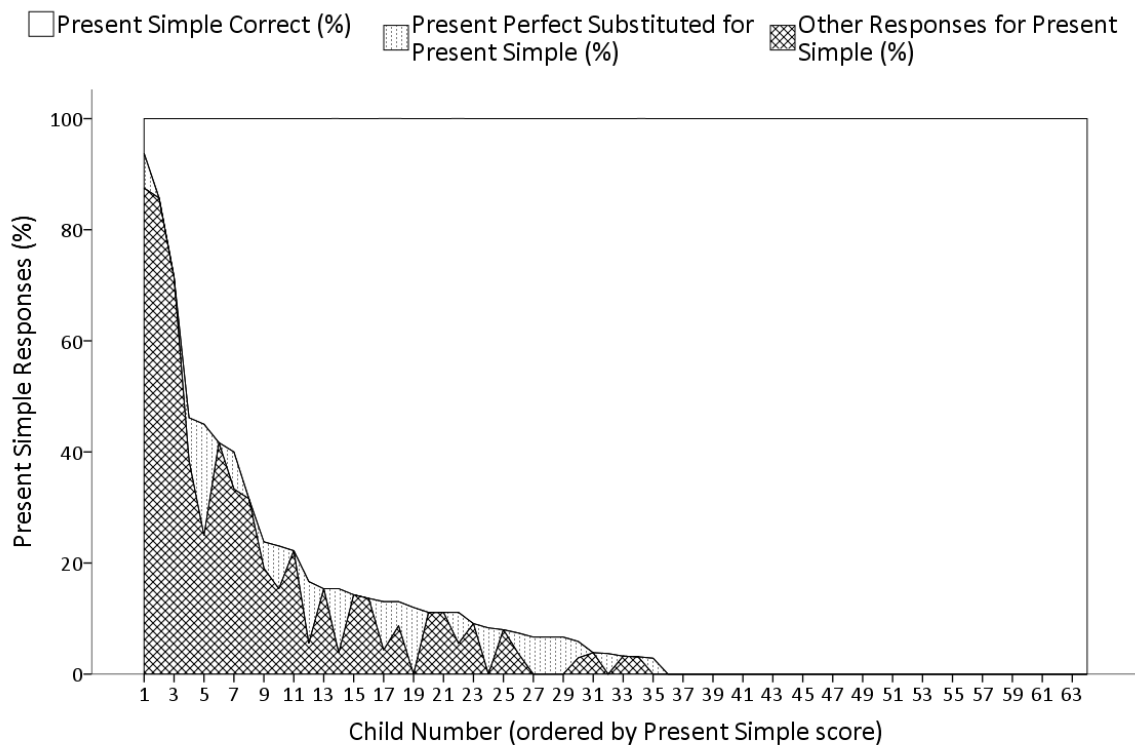


Figure 6.2. Present Simple accuracy and error patterns

Figure 6.2 shows children's accuracy and their errors on the Present Simple task.

Children have been arranged on the horizontal axis by their accuracy in the target form in order to determine how the error pattern changes as children develop greater mastery of the target form. Among the three forms under discussion, the Present Simple is structurally the simplest with no tense and aspect markers (Table 3.1). Figure 6.2 shows that the accuracy rate is remarkably high for this form. Forty-five percent of children (29 of 64) had no error at all in the task. The deviations in this task sometimes consisted of the Present Perfect counterparts. However, many of the errors were very random that mostly comprised of verbless responses, unclear utterances, no-responses etc.

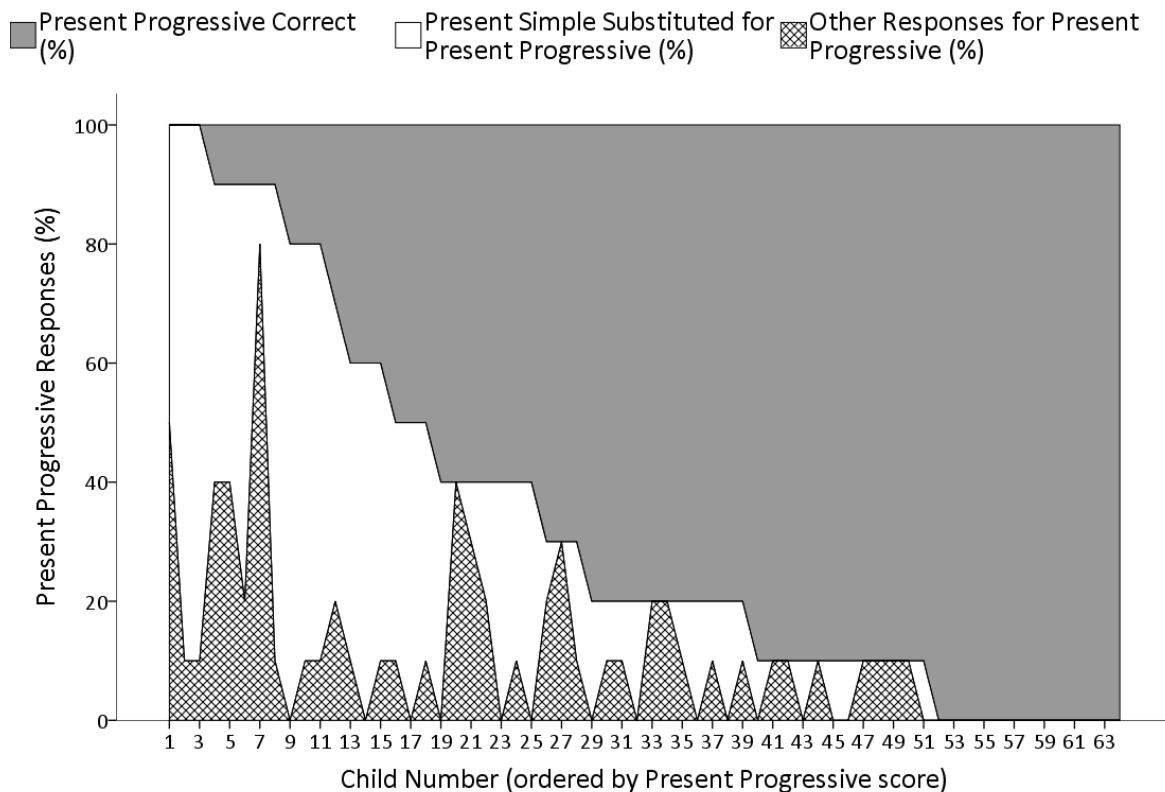


Figure 6.3. Present Progressive accuracy and error pattern

Figure 6.3 shows success rates and the errors in the Present Progressive task. Children are arranged on the X axis in the order of their accuracy percentage in the task. As is evident from the graph, the Present Progressive form in Bangla emerges quite early and is mastered quite fast; Only 4.69% of the participants (3 of 64) children had a score of 'zero' and 56% of children (36 of 64) had 80% or greater success in this form. Apart from a set of 'other responses', the target form in this task had a frequently occurring substitute- the Present Simple.

One issue is worth consideration here: in Bangla the Present Simple form is also permissible for the Present Progressive. To my knowledge, there is no contextual specification that strictly warrants the Present Progressive. It is possible that for some children, use of Present Simple for Present Progressive did not result from an absence of the target form. It is possible that for some children production of the Present Simple form in this task was driven by their awareness of the flexibility allowed in Bangla.

However, the eliciting stimuli given to children were in the Present Progressive form. It was expected that the children would be primed to supply the Present Progressive form if it was available to them (cf. Leonard, 2011). Therefore, despite the knowledge of both possibilities, children with the mastery of the target form were expected to produce it because the stimuli were in this form.

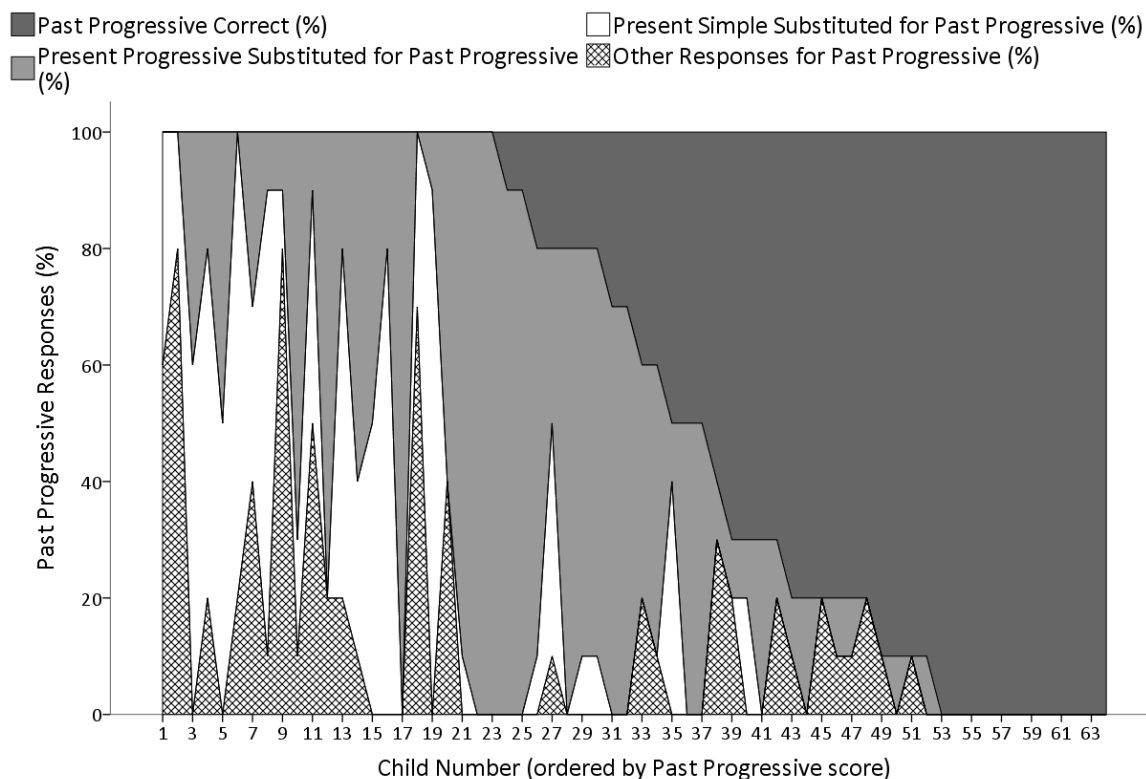


Figure 6.4. Past Progressive accuracy and error pattern

Figure 6.4 represents children's responses in the Past Progressive task which include the correct forms and the different deviations. Children are arranged on the horizontal axis in order of their scores on the Past Progressive task. In other words, the graph demonstrates how children's choice of substitutes has changed as they mastered the Past Progressive forms.

The Past Progressive form is the most complex of the three verb forms and one of the structurally longest forms of verb conjugation in Bangla. The inflected form contains four elements: verb stem, aspect marker, tense marker and person marker. Figure 6.4 suggests that it was challenging for the children and often the target form was replaced by other forms. Only 34% children (22 of 64) achieved 80% accuracy or above.

Because children were arranged according to their performance on the Past Progressive task, the correct responses clustered on the right side of the graph (Figure 6.4). As shown in Figure 6.4, children's responses in this task revealed a remarkable pattern. As children began to master the target form, they started using more Present Progressive forms than the Present Simple forms as errors. There was a peak of the Present Progressive in errors right before the emergence of the Past Progressive form. This suggests that with increasing knowledge of the Past Progressive form, they began to choose a more suitable (in terms of features) and complex form even for errors. This also explains why the Present Simple forms were abundant among children with lower abilities. Finally, when the Past Progressive form emerged and became frequent, there was an expected decline in the use of the Present Progressive form as a substitute.

To summarise, the error patterns revealed that before mastery of the target form,

- for the Present Simple, the substitutes were infrequent Present Perfect forms and a set of 'other' responses
- for the Present Progressive, the substitutes were the Present Simple form and a set of 'other' responses
- for the Past Progressive, the substitutes were the Present Simple and the Present Progressive forms, and a set of 'other' responses

6.5 Stages of Acquisition

A close look into the error patterns on the Past Progressive task indicated an intriguing association that was followed up with further analyses. It was noted that when children

acquired the Present Progressive form, they often chose this form over the Present Simple as a substitute for Past Progressive. To confirm this, a correlation analysis between children's use of the Present Progressive form and their use of this form as a substitute for the Past Progressive form was run. The analysis only included children with no instances of the Past Progressive form ($n = 23$) since the emergence of the Past Progressive form would automatically lead to a decline in the use of the Present Progressive form as a substitute. Results showed a strong association between the two variables ($r_{(23)} = .79$, $p < .001$). The strong positive correlation indicated that once children mastered a relatively complex verb form (the Present Progressive), they tended to use it as a substitute instead of a simpler form (the Present Simple). This revelation was significant because it suggested that with more mastery children adjusted the errors according to their developmental stage. This finding led to conducting a cluster analysis in order to understand the developmental picture of the Bangla-speaking children.

6.5.1 Cluster analysis. The children participating in the study varied in age and it was likely that they were at different stages of language acquisition. The purpose of performing a cluster analysis was to examine if the children recruited in the present study could be meaningfully grouped with regard to their performances on the three verb forms. If the children could be identified to be in different groups, then a developmental picture of Bangla verb morphology might emerge.

A cluster analysis was run using SPSS (IBM Corp., 2011) with a set of six scores obtained from the three tasks: percent accuracy in the 1) Present Simple, 2) Present Progressive and 3) Past Progressive tasks, and percent substitution of 4) the Present Simple for Present Progressive, 5) the Present Simple for Past Progressive, and 6) the Present Progressive for Past

Progressive. These scores were entered as grouping factors, and SPSS was instructed to return three clusters that were optimally different. The assumption behind the choice of the number of clusters was that the children might be at different developmental stages in terms of the three morphological forms. Therefore, the analysis was performed with the instruction to return three clusters, instead of the automatic selection of cluster numbers. Using the six task scores as grouping factors meant the output was likely to present three groups of children who were developmentally different with regard to the three morphological forms.

The output of the cluster analysis yields a qualitative judgement of goodness of fit of 'poor' to 'good' (IBM Corp., 2011), and the resulting clusters were described as 'good' in quality. The analysis obtained three clusters among which children were reasonably distributed; cluster 1, 2 and 3 consisted of 18 (28.13%), 19 (29.69%) and 27 (42.19%) children respectively. For the purpose of analysis and interpretation, these clusters are referred to as groups hereafter. The descriptive statistics performed on the accuracy and the substitution rates on the three tasks across the clusters are shown in Table 6.11. The mean accuracy displayed in the table indicates that the children in these three groups were different in their performance on the tests, confirming the viability of pre-selecting three groups as the outcome of the cluster analysis. Group 1 scored low in both the Present Progressive and the Past Progressive tasks and they were moderate in the Present Simple form (Figure 6.5). Group 2 was good both in the Present Simple and the Present Progressive but not in the Past Progressive form. Finally, the children in Group 3 were good in all three forms.

Table 6.11

Overall Performance Profile of Three Clusters of Children

Language domains/ measures	Group 1 (n = 18)		Group 2 (n = 19)		Group 3 (n = 27)	
	M	SD	M	SD	M	SD
Past Progressive (%)	6.11	15.01	15.79	17.42	88.15	12.72
Present Progressive (%)	28.33	25.26	84.74	13.07	80.74	21.11
Present Simple (%)	69.60	28.31	92.59	10.67	97.83	3.57
Present Simple for Present Progressive (%)	51.67	25.50	8.95	10.49	12.59	20.11
Present Simple for Past Progressive (%)	47.78	25.10	4.74	8.41	.74	3.85
Present Progressive for Past Progressive (%)	20	17.82	74.21	17.74	5.19	7.53
MLUadj*	4.33	.52	5.08	.47	5.46	.78
Bound Morpheme Type*	19	4.50	26.05	3.52	27.81	4.48
Word Type*	77.44	25.09	120.95	24.93	124.81	35.06
Age (month)*	30.11	4.58	38.58	6.15	40.85	6.79

Note. The measures with an asterisk (*) mark are presented for the purpose of describing the clusters; they were not determinants to the clusters.

The error patterns across the three groups were informative to determine the linguistic achievements of each group (Figure 6.6). Use of the Present Simple form in both the Present Progressive and Past Progressive tasks was quite high for Group 1 but these children did not use the Present Progressive for Past Progressive very often. The Present Simple form was not a common substitute for Group 2, instead they used the Present Progressive forms quite

frequently in the Past Progressive task. All three types of error patterns were very low for Group 3.

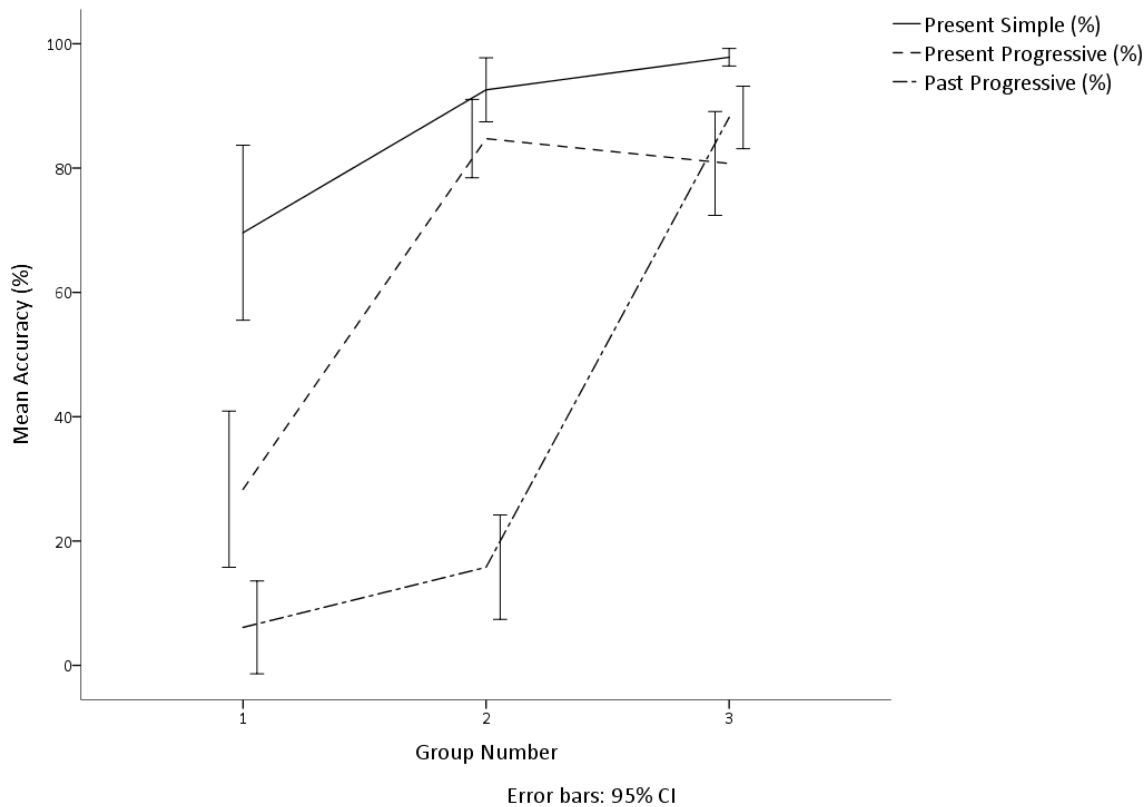


Figure 6.5. Accuracy rates on the three forms across the three groups

The substitution patterns found in these groups reinforced the accuracy rates. Note that Group 1 had mastered only the Present Simple form; therefore, it was expected that they would be able to supply only this form in errors too. Similarly, since Group 2 had a high accuracy in the Present Progressive form, their substitution was mainly by this form and the use of Present Simple in substitution was very low for them. Finally, Group 3 had all three forms in their repertoire and their mastery is confirmed by their infrequent use of other forms in the three tasks.

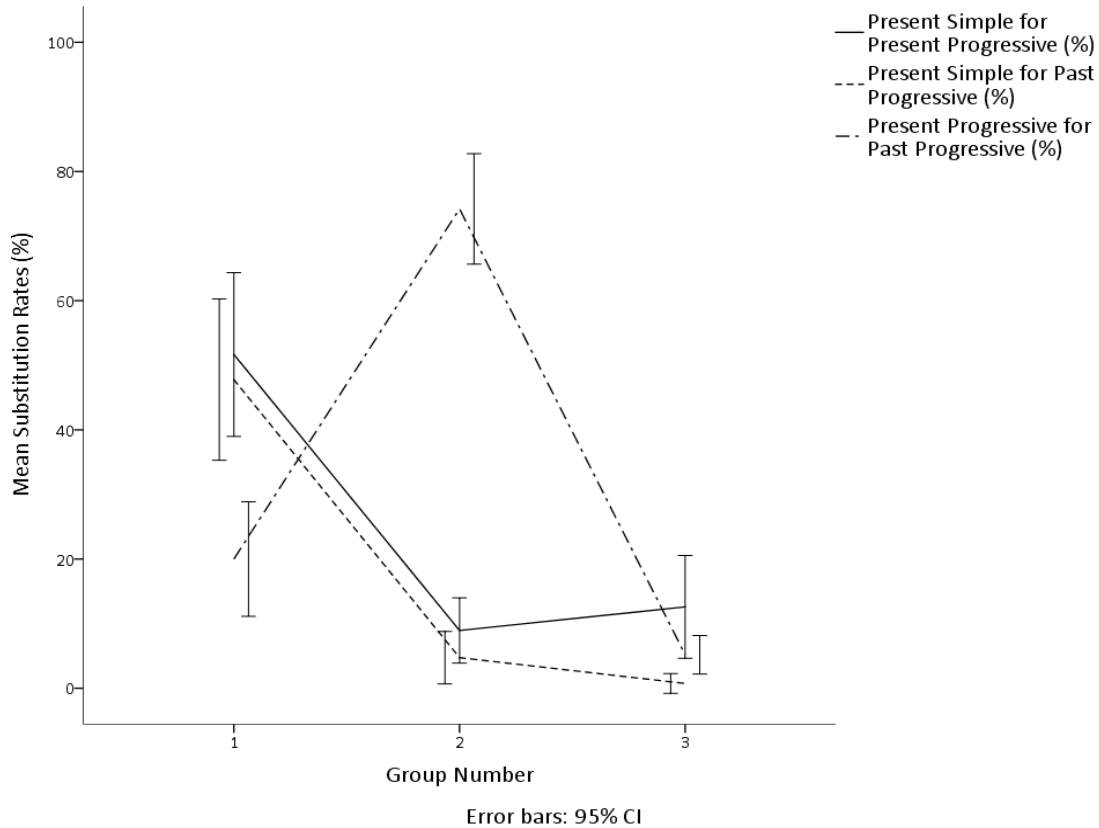


Figure 6.6. Substitution rates across the three groups

Table 6.11 also displays the mean age and mean values of some of the measures calculated from the language samples. Across all the language measures, Group 2 appeared to achieve much higher scores than Group 1. However, the increase from Group 2 to Group 3 was not so striking. A similar trend was observed in the distribution of Age across the groups; Children in Group 1 were much younger than Group 2 who were almost as old as Group 3.

6.5.2 Group differences. In order to validate the clustering of the children, the cluster analysis was followed up with a set of one-way ANOVAs. On SPSS all the measures of interest, i.e. the test scores, the substitution scores, Age and the other language measures, were entered into the 'dependent list' and the group number from the cluster analysis was entered

as the 'factor'. To identify which groups differed from one another on the measures, a post-hoc test appropriate for groups of different sizes (Field, 2009), Hochberg's GT2, was run. For some dependent variables assumption of homogeneity was violated. Kruskal-Wallis test values were reported for those variables. Table 6.5 displays the results from the post-hoc analysis.

Levene's test of homogeneity of variance indicated that the assumption was violated for the Present Simple dataset. Therefore, the Kruskal-Wallis test was run for this set to examine the group difference. Results indicated that Group 2 and Group 3 were similar in their performance of the Present Simple form but they both were significantly better than Group 1 ($H_{(2)} = 24.12, p < .001$). Results of the Kruskal-Wallis test for the Present Progressive performance indicated that Group 1 scored significantly lower than both Group 2 and Group 3 who were found to be similar in their performance in the Present Progressive forms ($H_{(2)} = 31.61, p < .001$). A one-way ANOVA run for the Past Progressive scores showed that Group 1 and Group 2 performed similarly but Group 3 performed significantly higher than both of them ($F_{(2, 61)} = 211.44, p < .001$).

For all three substitution scores, the assumption of homogeneity was violated. The Kruskal-Wallis test results of the errors in the three experimental tasks showed that the use of the Present Simple form for the Present Progressive was significantly higher for Group 1; Group 2 and Group 3 were similar in their use ($H_{(2)} = 25.31, p < .001$). Similarly, Group 1 used the Present Simple form significantly more often in place of the Past Progressive form than Group 2 and Group 3 who were found to be similar ($H_{(2)} = 44.45, p < .001$). In the use of Present

Progressive for Past Progressive, Group 1 and Group 3 had similar scores, but Group 2 used this form significantly more often than the others ($H_{(2)} = 44.91$, $p < .001$).

Table 6.12

Post-hoc Results of Group Differences

Variables	Group differences (ANOVA/ Kruskal- Wallis)		Significance		
			1 & 2	1 & 3	2 & 3
PS	1 < 2 = 3	Kruskal-Wallis	$p = .010$	$p < .001$	$p = .228$
PresProg	1 < 2 = 3	Kruskal-Wallis	$p < .001$	$p < .001$	$p = 1$
PastProg	1 = 2 < 3	ANOVA (Hochberg's GT2)	$p = .148$	$p < .001$	$p < .001$
PS for PresProg	1 > 2 = 3	Kruskal-Wallis	$p < .001$	$p < .001$	$p = 1$
PS for PastProg	1 > 2 = 3	Kruskal-Wallis	$p < .001$	$p < .001$	$p = .499$
PresProg for PastProg	1 = 3 < 2	Kruskal-Wallis	$p < .001$	$p = .079$	$p < .001$
MLUadj	1 < 2 = 3	ANOVA (Hochberg's GT2)	$p = .002$	$p < .001$	$p = .147$
Bound Morpheme Type	1 < 2 = 3	ANOVA (Hochberg's GT2)	$p < .001$	$p < .001$	$p = .422$
Word Type	1 < 2 = 3	ANOVA (Hochberg's GT2)	$p < .001$	$p < .001$	$p = .962$
Age (month)	1 < 2 = 3	ANOVA (Hochberg's GT2)	$p < .001$	$p < .001$	$p = .512$

Note. The groups are expressed by their numbers.

All the datasets for the other dependent variables, i.e. Age, MLUadj, BMT and Word Type, complied with the assumption of homogeneity. Therefore, a one-way ANOVA was run for each variable. The overall picture of group difference was very similar across the variables. Groups 2 and 3 were constituted of children of similar ages, whereas Group 1 was much younger than them ($F_{(2, 61)} = 17.74, p < .001$). Similarly, for all the variables Group 2 and Group 3 had significantly higher scores than Group 1 but the difference between Group 2 and Group 3 did not achieve statistical significance. (MLUadj: $F_{(2, 61)} = 17.01, p < .001$; BMT: $F_{(2, 61)} = 24.67, p < .001$; Word Type: $F_{(2, 61)} = 15.45, p < .001$). Results of the post-hoc analyses are summarised in Table 6.12.

6.5.3 Repeated measures ANOVA. The three groups were not only different on the language measures, their performance across the measures also differed within each group (see Figure 6.7). A 3X3 repeated measures ANOVA was run with three groups and three test scores. The purpose of the analysis was to examine any difference in the levels of mastery achieved in the forms within the groups. In case of violation of sphericity in the data, Greenhouse-Geisser's correction was used and Hochberg's GT2 was used for post-hoc analyses. A significant difference was found within each group. For Group 1 ($n = 18$), the accuracy rates in the three forms were different enough to achieve statistical significance ($F_{(2, 34)} = 38.07, p < .001$, partial $\eta^2 = .69$). Children's success in Present Progressive was significantly higher than that in Past Progressive ($p = .009$) and their Present Simple score was significantly higher than both the Present Progressive ($p = .001$) and the Past Progressive ($p < .001$) scores. For Group 2 ($n = 19$), the scores of the tests were significantly different too ($F_{(2, 36)} = 304.31, p < .001$, partial $\eta^2 = .94$). Their Present Simple scores were significantly higher than their Present Progressive (p

= .048) and their Past Progressive ($p < .001$) scores. There was also a significant difference between their Present Progressive and their Past Progressive scores ($p < .001$). The dataset for Group 3 ($n = 27$) violated the test of sphericity and therefore corresponding values from Greenhouse-Geisser's correction were reported. This group too was found to be significantly different across the three scores ($F_{(1.45, 37.78)} = 10.06$, $p = .001$, partial $\eta^2 = .28$). They performed significantly higher in Present Simple than in Present Progressive ($p < .001$) and in Past Progressive ($p = .003$). However, their accuracy scores in the Present Progressive and in the Past Progressive forms were very similar ($p > .05$).

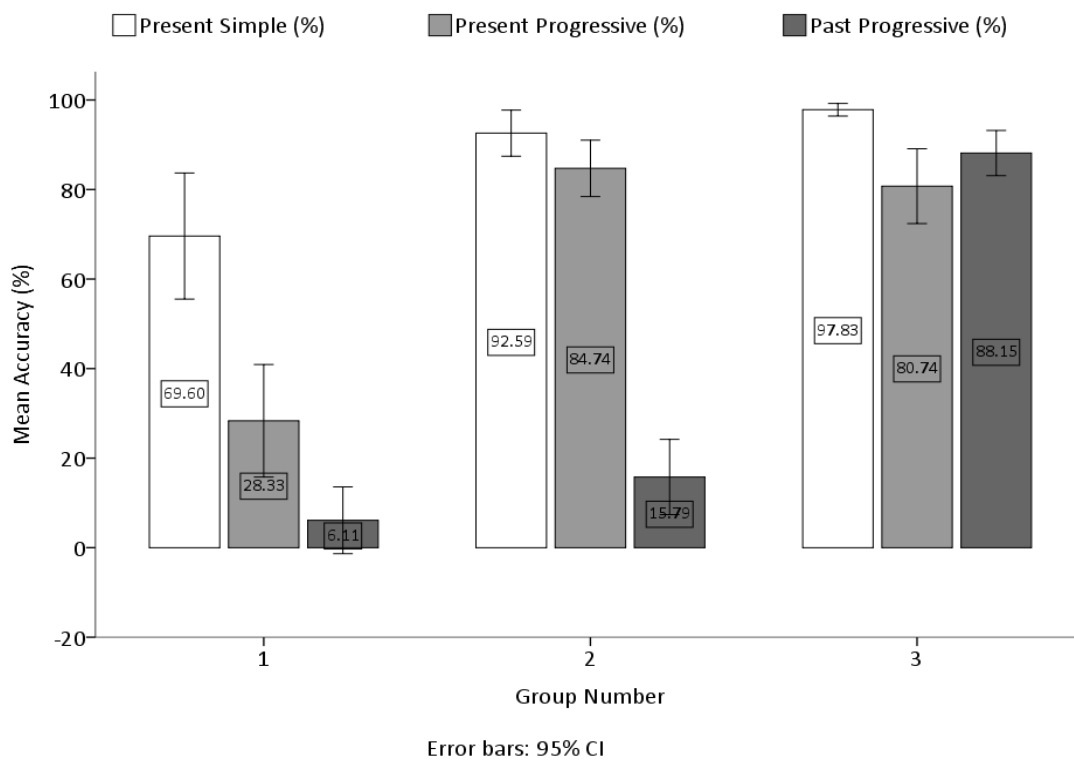


Figure 6.7. Performances of children across the three groups on the three morphological forms

This means that there was an overall difference in the success rates of the forms within each group of children (Present Simple > Present Progressive > Past progressive) (Figure 6.7). However, with proficiency children were found to arrive at a stage where they performed similarly on the forms: Group 3 had similar success rates in the Present Progressive and the Past Progressive forms. They, however, had not mastered these forms to the degree of the Present Simple forms yet.

6.6 Summary

The chapter presents a description of typically-developing Bangla-speaking children's morphological development across different language measures and the patterns of their errors prior to the mastery in those forms. It also shows the association between the test scores, and their age and other language measures. A summary of the findings of the study follows.

- The developmental sequence of verb conjugations in Bangla is Present Simple → Present Progressive → Past Progressive. The Present Simple form largely surpassed the other two forms in success rates. Of the remaining two, the Present Progressive form was found to emerge earlier than the Past Progressive form.
- Based on the accuracy rates and the results from the cluster analysis, three stages of development are proposed (Figure 6.8). Children's first achievement is the Present Simple form (Stage 1) and as they move along Stage 2 and 3, they acquire the Present Progressive and the Past Progressive forms respectively.

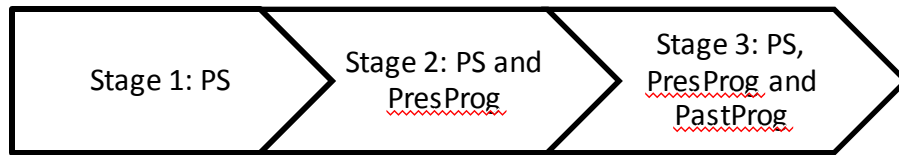


Figure 6.8. Proposed developmental stages of Bangla-speaking children

- The error patterns suggest that before the mastery of a conjugated verb form, children tend to substitute the target form with the closest possible feature-match available in their repertoire. Therefore, a child in Stage 2 tends to substitute the Past Progressive form not with the Present Simple, but with the Present Progressive form.
- The correlation and the regression analyses show that both Age and MLUadj have strong associations with the test scores with Age showing a stronger relationship than MLUadj in most cases. An additional language measure, Bound Morpheme Type (BMT), has been used in this study. This new measure, derived from children's spontaneous language samples, had stronger relationships with the test scores compared with Age and MLUadj, and has been found to be a good index of children's morphological knowledge.
- The repeated measures ANOVA results suggest that children tend to perform on the three morphological forms with different levels of accuracy, which possibly is due to the difference in complexity of the forms. However, once they obtain a good overall proficiency (Group 3), difference between the accuracy rates in the forms subsides. The accuracy in the Present Simple form still remains much higher than the other two forms. It probably takes children some more time to become proficient enough to have their performance affected by the complexity of the forms only minimally.

Chapter Seven

Findings: Children with Language Impairment

One of the aims of the study was to examine the development of children with language impairment by assessing their mastery of the target inflections. This was achieved by testing a small group of children with language difficulty on three experimental tasks and collecting samples of their spontaneous language. The group of children with LI was relatively small. Participants were nine children, seven boys and two girls, with different developmental disorders that affected their language. As mentioned earlier, they were all recruited from a special school in Dhaka. A general profile of these children is presented in Chapter 5 (Table 5.2).

7.1 Limitations

It should be stated at the outset that as the first of its kind the study was developed in the face of limitations at every stage. Recruiting children with language difficulties was not an exception. Participants in this group did not go through any formal screening such as taking standardized tests before recruitment in this study. However, they were all recruited from a special school and as confirmation of their language difficulties, reports of the assessments done by the school or by other clinical experts were collected for each child. The inclusion of these children was largely based on these reports. The group was controlled for age, i.e. all children were below age ten (age range 47-112 months). Although the study aimed at identifying the challenges to morphological development in Bangla-speaking children with SLI, the participants were a mixed group with different cognitive difficulties that included autism,

Down's syndrome, intellectual disorder, and developmental delay (see Table 5.2). As reported in Chapter 5, there is no identified SLI population in Bangladesh. Therefore, a mixed group of children were recruited to discover a possible developmental picture of the SLI population in this context. Assuming a reasonable overlap across the categories of language difficulties, a similar approach was also employed with a mixed group in the study on Turkish-speaking children with LI (Acarlar & Johnston, 2011).

As mentioned previously, precedents in the Bangla research literature in the field of child language disorders are unavailable which makes this study both essential and challenging at the same time. In want of resources for a systematic assessment, the recruitment was done very crudely. The group was diverse with varied language abilities, which often made advanced analyses impossible. Therefore, it was recognised that the findings from the analyses would just be the starting point to building a structured profile of language abilities of Bangla-speaking children with language impairment.

7.2 Descriptive Statistics

As was done with the TD children, three experimental tasks and a play-session with the experimenter were administered with the LI group that elicited the children's use of the three verb forms in Bangla, and obtained an overall representation of their morphosyntactic skills (please see section 5.3 for a detailed description of the tasks). Table 7.1 presents the language measures calculated from the language samples of the children with language impairment (LI group) and Table 7.2 shows their scores on the experimental tasks on three verb forms in Bangla. The two tables contain all the descriptive measures reported previously for the group of

typically-developing children (TD group). Comparison between the two groups across the measures (Table 6.1 and 7.1, and Table 6.2 and 7.2) showed that although the LI group was older than the TD group, their scores on each language measure were lower than those of the TD group.

Table 7.1

Measures Derived from the Language Samples of the LI Children (N= 9)

	Range (Max- Min)	Mean	SD
Age (month)	65 (112 – 47)	88.11	21.05
MLU	2.85 (4.83 – 1.98)	3.18	.86
MLUadj	2.89 (6.39 – 3.50)	4.43	.93
TNU	131 (178 – 47)	117.11	42.56
TNW	389 (455 – 66)	232.67	109.71
Number of Word Types	79 (125 – 46)	77.67	25.70
TBM	213 (261 – 48)	141.89	68.55
BMT	16 (28 – 12)	19	5.64

Note. MLU = Mean length of utterance, MLUadj = Adjusted mean length of utterance, TNU = Total number of utterances, TNW = Total number of words, TBM = Total bound morphemes, BMT = Bound morpheme types.

Table 7.2

Accuracy of the LI Group on Three Tasks (N= 9)

	Range (Max – Min)	Mean	SD
Present Simple (N = 9)	93.75 (100 – 6.25)	53.29	30.63
Present Progressive	60 (60 – 0)	27.78	21.67
Past Progressive	60 (60 – 0)	8.89	20.28

The performance of the groups on the experimental tasks is shown in Figure 7.1. A distinct difference in the degree of accuracy was observed for each form. However, the groups showed similarity in the fact that for both groups the Present Simple form was performed with highest accuracy, followed by the Present Progressive and the Past Progressive forms respectively. The observation was tested with a repeated measure ANOVA which revealed that, within the LI group, there was a significant difference in the level of accuracy on the forms ($F_{(2,16)} = 11.27$, $p = .001$, partial $\eta^2 = .59$). A set of pairwise comparisons found that children's accuracy in the Present Simple form was significantly higher than the Past Progressive form ($p = .002$). However, possibly due to the small sample size and the variance, the difference between accuracy in Present Simple and Present Progressive ($p = .151$), and difference in Present Progressive and Past Progressive forms did not reach statistical significance ($p = .165$).

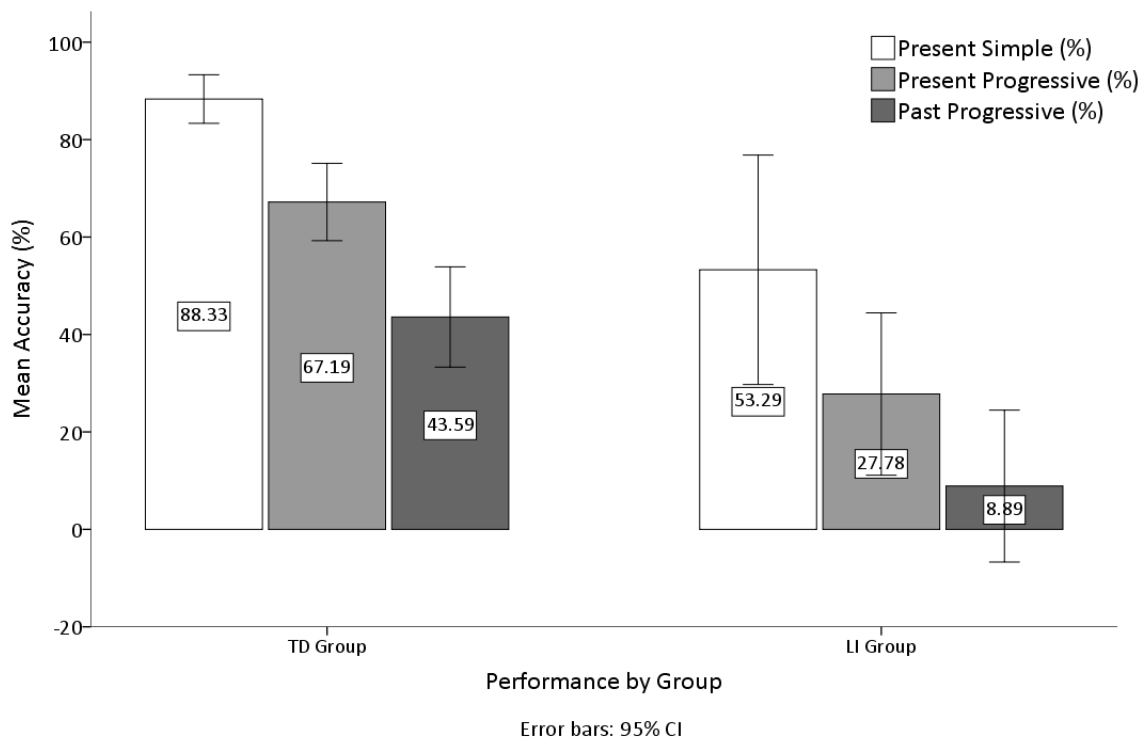


Figure 7.1. Mean scores (%) of the two groups on the three elicitation tasks

7.3 Error Analysis

Responses elicited from the children with LI on the three tasks showed remarkable similarity to those of the TD children. When the target form was not available in the repertoire, children with language impairment tended to choose what the typically-developing children also chose as a possible substitute. For example, the Present Simple form did not have any other dominant verb conjugation as substitutes except for infrequent uses of the Present Perfect form (Figure 7.2). The deviations were mostly ‘other responses’ which consisted of imitations (therefore not credited), no responses, noun responses, meaningless responses and unclear responses.

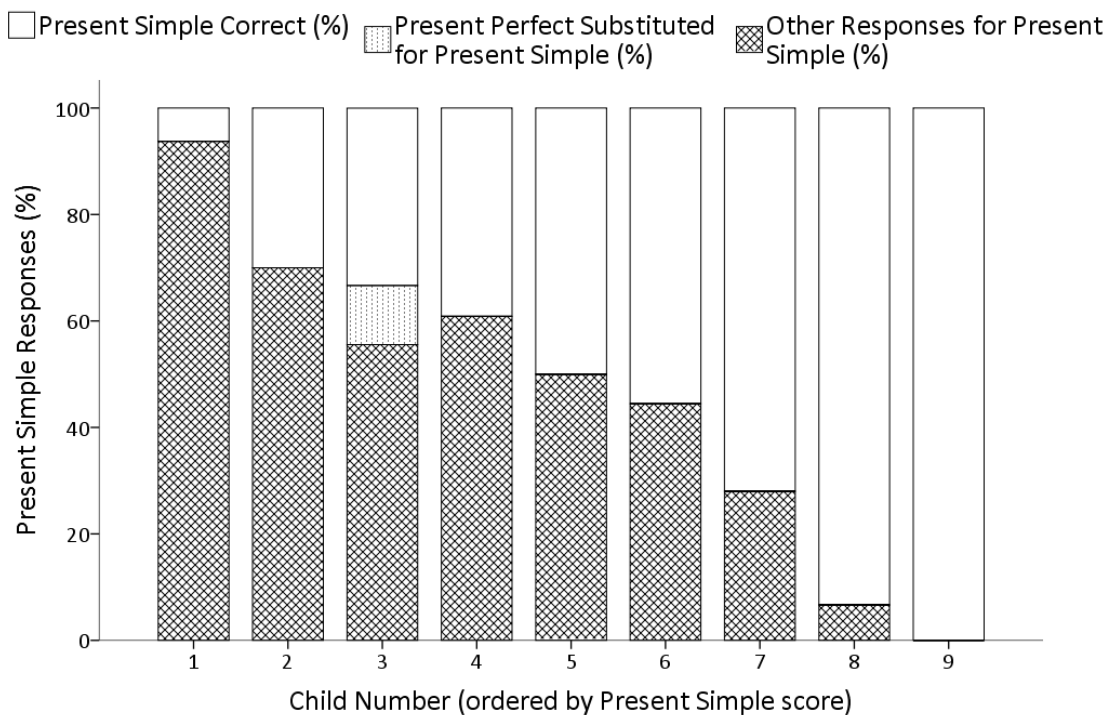


Figure 7.2. Accuracy and substitution on the Present Simple task

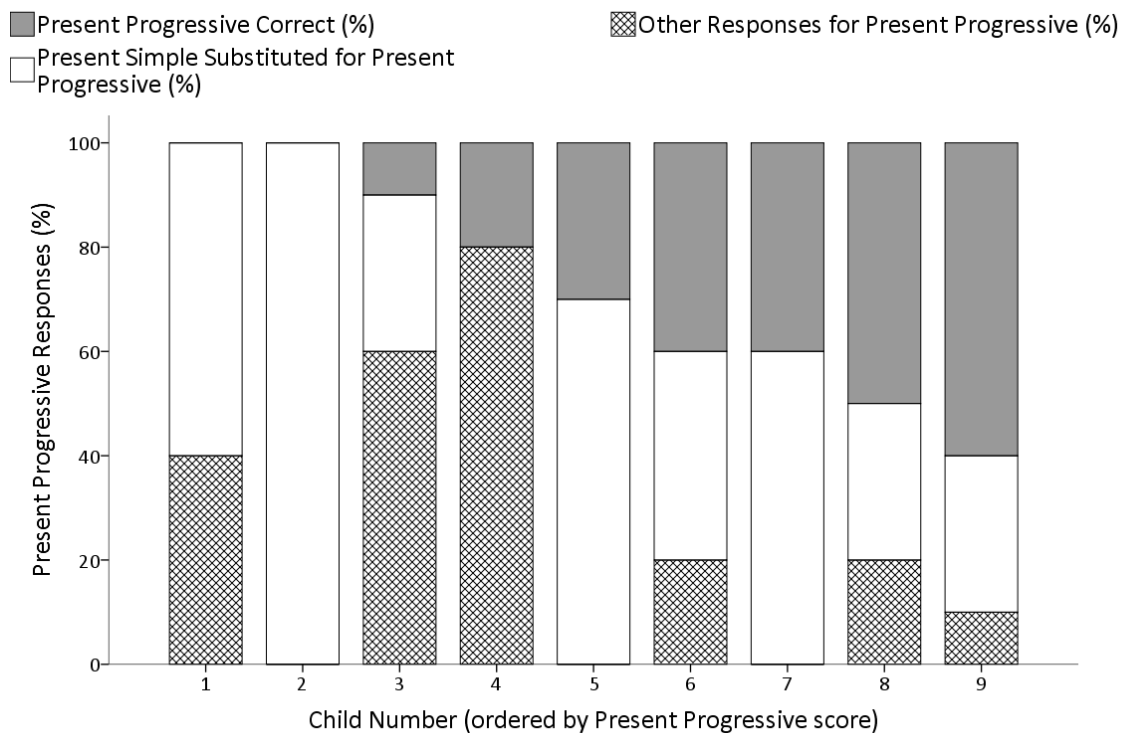


Figure 7.3. Accuracy and substitution on the Present Progressive task

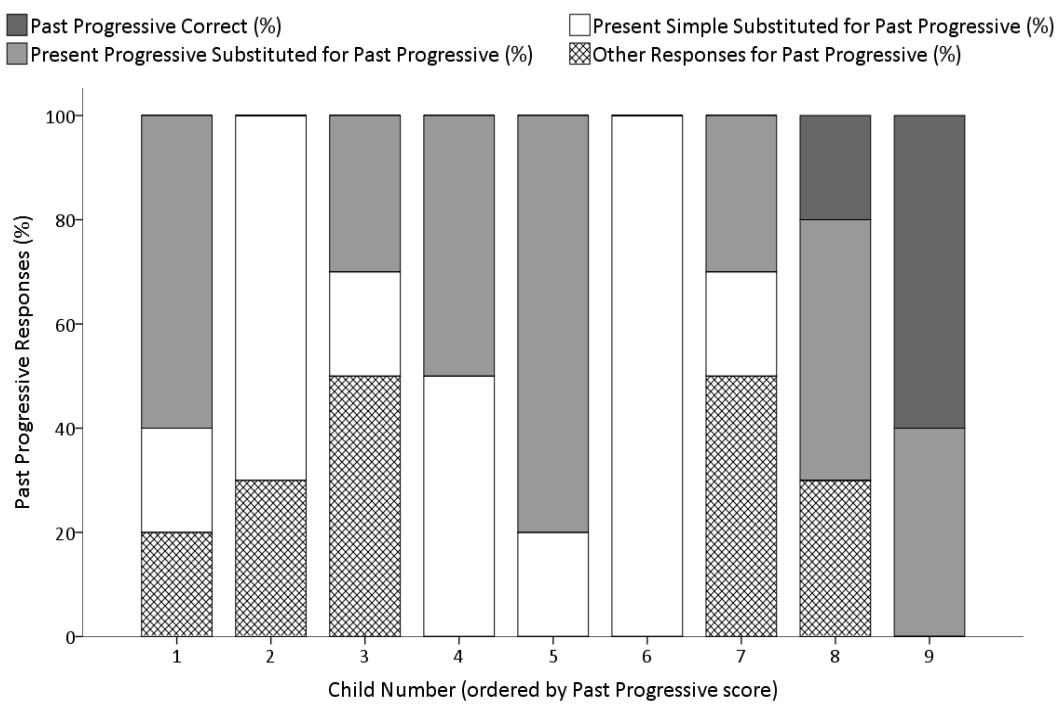


Figure 7.4. Accuracy and substitution on the Past Progressive task

Performance was also similar to the typically-developing children on the Present Progressive and the Past Progressive tasks. In the Present Progressive task, a dominant non-target form was the Present Simple form as it was for the typically-developing group. 'Other responses' comprised of the rest of the non-target forms (the responses in the 'other responses' category were consistent to a large extent for all the tasks). Finally, similarity was also observed in the errors between the groups on the Past Progressive task. The dominant errors were the Present Simple and the Present Progressive forms and children also sometimes supplied imitated forms, nouns, unclear and no-responses.

Children's correct responses and different non-target forms are presented in bar charts (Figures 7.2 – 7.4). As mentioned earlier, although the degree of accuracy was lower, the error patterns of the LI children were remarkably similar to those of the TD children. Their choice of substitutions for any target form was not distinctly different from the TD children. This resemblance in the error patterns pointed at a possibility of language impairment being simply a delay on the typical developmental trajectory.

7.4 Group Differences

Descriptive statistics generated for the two groups (Tables 6.1 and 6.2, and 7.1 and 7.2) showed that children with language impairment, although much older, had lower scores on the experimental tasks and the language sample measures. In order to identify the level of significance in group difference, a series of one-way ANOVAs was run for normally distributed data, with Mann-Whitney U tests run for non-normal distributions.

Although significantly older ($U = 8$, $p < .001$), the LI group of children had significantly fewer success than their TD peers. The groups were found to be significantly different in their performance on all the tasks. The LI group scored significantly lower than the TD group in the Present Simple ($U = 102.50$, $p = .001$), Present Progressive ($F_{(1, 71)} = 12.94$; $p = .001$) and Past Progressive task ($U = 145.50$, $p = .013$).

Results from the language sample measures exhibited similar trends. The LI group was found to have less mastery than the TD group in all the measures (MLU: $F_{(1, 71)} = 4.12$, $p = .046$; MLUadj: $F_{(1, 71)} = 4.50$, $p = .037$; Total Number of Word: $F_{(1, 71)} = 12.20$, $p = .001$; Word Type: $F_{(1, 71)} = 6.92$, $p = .010$; Total Number of Utterance: $F_{(1, 71)} = 12.08$, $p = .001$; Total Bound Morpheme: $F_{(1, 71)} = 11.04$, $p = .001$; Bound Morpheme Type: $F_{(1, 71)} = 8.51$, $p = .005$). These indices suggested that children with language difficulty had poorer skills in both morphological complexity and lexical diversity in structured or spontaneous contexts.

7.5 Route of Development

Given the difference in performance between the two groups (TD and LI), it was also important to examine the level of development of the LI group. The descriptive statistics and ANOVA results clearly indicated that children with language impairment had a significantly lower level of accuracy in verb inflections and a range of other measures of language. In order to identify their level of development and to ascertain if they conform to the proposed stages of typical development, a discriminant function analysis was performed using SPSS (IBM Corp., 2011). A discriminant function analysis is primarily used to determine which variables are able to differentiate between two or more already identified groups. However, this analysis was

primarily performed with a different goal in the present study. The purpose of using this analysis was to determine, given the set of variables and three identified groups, how well a fourth group of children could be aligned with the other groups. In other words, the goal was to examine the development of the children with LI vis-à-vis the three typically-developing groups. The overlap between the LI group and any of the three TD groups could possibly identify the level of development of the children with language impairment. A similar statistical framework was reported by Hare and Smith (1996) that employed a cluster analysis, followed by a discriminant function analysis to classify additional items in the collection. However, the present group of children with LI was small and mixed, with children possibly affected in different degrees. Therefore, the finding needs to be interpreted cautiously.

Table 7.3

Standardized Canonical Discriminant Function Coefficients

	Function		
	1	2	3
Present Simple (%)	.262	.385	-1.106
Present Progressive (%)	-.141	.255	-.146
Past Progressive (%)	.784	-.095	.888
Present Simple for Present Progressive (%)	-.437	-.291	.303
Present Simple for Past Progressive (%)	-.065	-.303	.242
Present Progressive for Past Progressive (%)	-.329	.522	.872

The cluster analysis conducted earlier with the TD children had already assigned group numbers from 1 to 3 to each TD child. For the discriminant function analysis, the LI group was assigned number 4. The analysis was run with six determining variables, i.e. percent accuracy in Present Simple, percent accuracy in Present Progressive, percent accuracy in Past Progressive, percent substitution of Present Progressive by Present Simple, Percent substitution of Past Progressive by Present Simple and Percent substitution of Past Progressive by Present Progressive. The analysis produced three discriminant functions to differentiate among the four groups. Table 7.3 shows that children's accuracy in the Past progressive form was the strongest determining factor in Function 1. Function 2 was dominated by children's substitution of the Past Progressive by the Present Progressive form. Finally, the Present Simple score as well as the two previous contributors defined the third function. The first function accounted of 70.7% of the variance with canonical $R^2 = .88$. Function 2 explained 26.4% of the variance with canonical $R^2 = .73$ and Function 3 explained 2.9% of the variance with canonical $R^2 = .23$. Together these functions successfully discriminated the groups; the overall Wilks's lambda was significant ($\Lambda = .03$, $\chi^2_{(18)} = 244.28$, $p < .001$). The other two functions both were individually significant too; both residual Wilks's lambdas were significant (Function 2 through 3: $\Lambda = .021$, $\chi^2_{(10)} = 103.10$, $p < .001$) and (Function 3: $\Lambda = .77$, $\chi^2_{(4)} = 17.20$, $p = .002$).

Results also showed how consistent group 4 was with the other groups, i.e. if the LI group had an overlapping performance with any other typically-developing group. The discriminant function model identified five children from the LI group who performed like one of the three TD groups. Three children were classified as group 1, which indicated that these children had a moderate mastery of the Present Simple form and very low accuracy in the

Present and the Past Progressive forms. One child was placed in group 2, i.e. the child had high accuracy rates in the Present Simple and the Present Progressive tasks, but low scores in the Past Progressive task. The discriminant function analysis also classified one child in group 3, which suggested that there was one child in the LI group who had high accuracy in all three verb forms. Locating the children with LI in the TD groups identified their current stages of development (albeit on a narrow scale) and indicated how well they fared with regard to mastering morphosyntax. Interestingly, the analysis also found four children in the LI group who did not match any of the three TD groups. The fact that their performance patterns were not consistent with any stages of typical development appeared to indicate that these stages might not be shared by a subgroup of children with language impairment.

Table 7.4

Performance Profiles of LI Children Classified in Different Groups

Language domains/ measures	Group 1 (n = 3)		Group 2 (n = 1)		Group 3 (n = 1)		Group 4 (n = 4)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Present Simple (%)	51.78	19.40	93.33	-	100	-	32.74	20.58
Present Progressive (%)	16.67	28.87	30	-	40	-	32.50	22.17
Past Progressive (%)	0	0	0	-	60	-	5	10
Present Simple for Present Progressive (%)	63.33	35.12	70	-	60	-	25	17.32
Present Simple for Past Progressive (%)	63.33	40.42	20	-	0	-	22.50	20.62
Present Progressive for Past Progressive (%)	10	17.32	80	-	40	-	47.50	12.58
MLUadj*	3.74	.30	4.43	-	6.39	-	4.45	.71
Bound Morpheme Type*	17.33	4.62	18	-	28	-	18.25	6.29
Word Type*	65.33	8.02	88	-	108	-	76.75	34.97
Age (month)*	92	25.71	100	-	102	-	78.75	22.31

Note. The measures with the asterisk (*) mark are presented for the purpose of describing the groups; they were not determinants to the discriminant function analysis.

Table 7.4 presents the descriptive statistics of the LI children's performance on the language tasks and the other measures with regard to the assigned group numbers. The Groups 1, 2 and 3 in the table contain children with LI who conformed to the corresponding TD groups, while Group 4 represents children who did not conform to any of the TD groups. Their scores

suggested (Table 7.4) that, as anticipated, their accuracy in the Past Progressive form was low (5%). A distinct characteristic of this group is that they not only had low accuracy in the Present Progressive form (32.5%), also they had low accuracy in the Present Simple form (32.74%). Note that the TD children participating in this study had an overall high accuracy rate in the Present Simple form (88.33%) and this form was not found to be challenging even for the 'least developed' group, Group 1. The standardised discriminant function coefficients (Table 7.3) also suggest that, in defining function 3, the Present Simple scores were the strongest contributors which discriminated between Group 1 and 3. Interestingly, the performances of this group did not reveal a degree of difference between the accuracy scores of the Present Simple and the Present Progressive forms, while the difference was identified, earlier in the study, as a feature of typical development. Moreover, the use of the Present Progressive form substituting the Past Progressive form in Group 4 exceeded the use of the Present Simple form substituting both the Present Progressive and the Past Progressive forms. These patterns of language use suggest a possibility that the language of the LI children may be disrupted to some degree and the previously proposed stages may only be common to TD children. However, Table 7.4 also indicates that the children in Group 4 were younger than the children in the other groups.

Therefore, it is also possible that their distinct language patterns will decline as they grow older.

The four groups of children are presented in Figures 7.5 and 7.6 using the discriminant function scores. As described earlier, SPSS generated three discriminant scores for each participant on the basis of the input variables which determined their group membership. These scores were plotted in two separate graphs to maximally discriminate the groups. Similar representations of the functions can be found in other studies that employed discriminant

function analysis (e.g. Chen et al., 2011; Hare & Smith, 1996). Figure 7.5 represents functions 1 and 2, while Figure 7.6 represents functions 2 and 3. Since the first two functions were used in Figure 7.5, the plot distinguished, broadly, Group 3 and Group 2 from the other two groups (see Table 7.3 for the list of contributors in the functions). The difference between Groups 1 and 3 was defined by Function 3 which, along with Function 2, is presented in Figure 7.6.

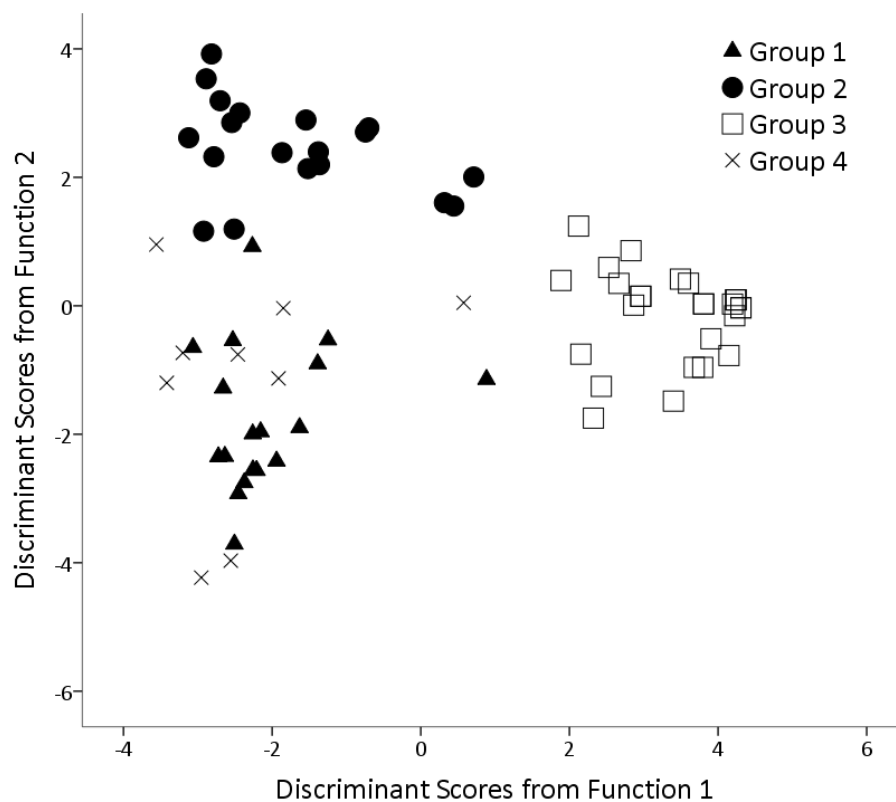


Figure 7.5. The four groups according to Functions 1 and 2

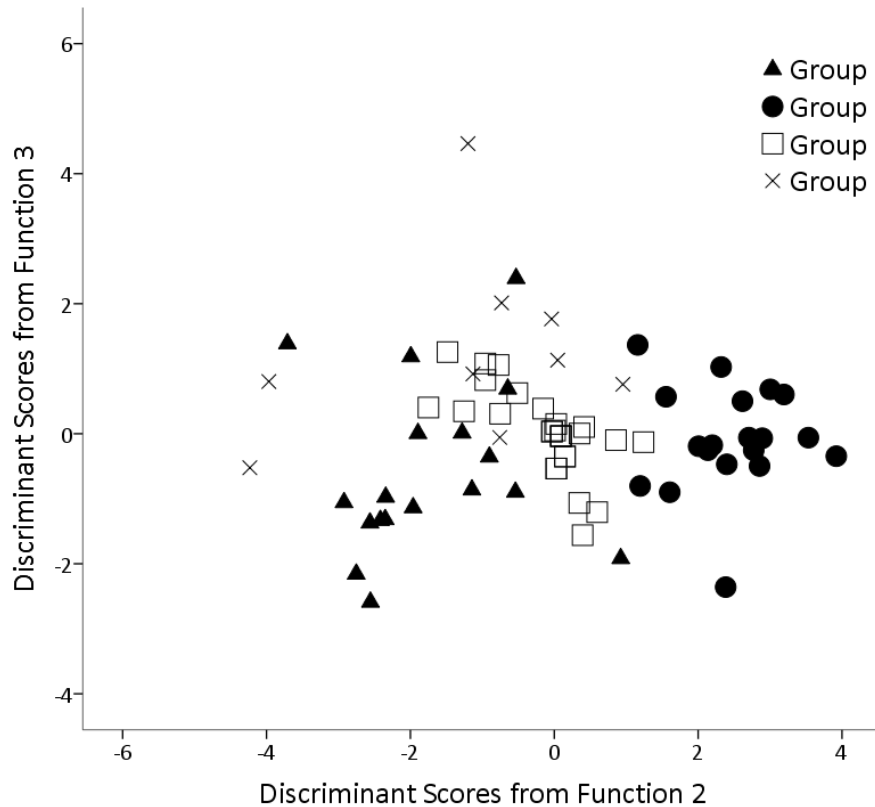


Figure 7.6. The four groups according to Functions 2 and 3

The discriminant function analysis found that some of the children with LI, in their success and errors, were similar to typically-developing children of varying abilities. At the same time, there was also a set of children in the LI group who were found to be inconsistent with typical development. There are several possible interpretations. Firstly, the group of children in the present study was varied in terms of their age range, and possibly in terms of the severity of the impairment. It is possible that a child (3;11) that was labelled group 4 by the discriminant function analysis would outgrow the seemingly deviant performance and conform to the TD stages later in the childhood. Secondly, the group recruited was small and heterogeneous in

many ways. Therefore, any reliable recommendation with regard to the developmental trajectory of the children with LI will require elaborately conducted systematic research.

7.6 Summary

The chapter presented results of a set of analyses run on the language data collected from nine children with language impairment using a set of experimental tasks and a language sample. Descriptive statistics revealed a clear difference in the language performances between the LI and the TD groups, which was confirmed using follow-up analyses of group differences, namely one-way ANOVA and Mann-Whitney U test. Children with language impairment were found to perform significantly lower than children who were significantly younger in age in all the indices employed in this study. Interestingly, there was no aberration in their error patterns. Whenever they deviated, they used a form that was also commonly chosen by younger typically-developing children. However, a discriminant function analysis revealed that although some children conformed to the stages of typical development found among younger TD children, other children with LI were inconsistent with typical development. The implications and cautions will be discussed in the following chapter.

Chapter Eight

Discussion

The objective of the study was to examine Bangla-speaking pre-school children's development of grammatical morphology and assess the development of children with LI with reference to the findings from typical development. The motivation for the study lay in the fact that there was no research available on the morphosyntactic development of Bangla-speaking children. The absence of a description of typical development has both academic and clinical implications. Due to the unavailability of information about Bangla and its language neighbours, there is an inadequate representation of these languages in the child language literature. In more practical terms, the dearth of this information is one of the main obstacles in assessing children with language difficulty with any authenticity and reliability.

Among the language areas, verb morphology has been a focus of attention for researchers since it has been widely documented to be especially challenging for children with typical or atypical development. Crosslinguistic investigations have revealed that young typically-developing children's language production is characterised by incorrect use of verbal inflections (e.g. Lakshmanan, 2006; Leonard, Caselli, & Devescovi, 2002; Schütze & Wexler, 1996). Early in development, children often omit the obligatory tense markers on verbs, fail to mark agreement correctly on verbs, and substitute for the target verb form with other verb forms. To examine children's development of Bangla verb morphology, three forms of verbal inflections, the Present Simple, the Present Progressive and the Past Progressive, were selected for examination in this study. Three elicitation tasks were designed and children's spontaneous

language samples were recorded to examine their performance on the three verb forms. Two groups of children participated in the study: a group of 70 children with typical development between 23 to 51 months, and a group of nine children with language difficulties between 47 to 112 months of age.

Specific research questions that the study aimed to answer were:

1. What is the developmental route for acquiring the selected verb inflections in Bangla?
(addressed in sections 8.1 and 8.5)
2. Is MLU a better predictor of language abilities (demonstrated in the accuracy of the forms tested) than age? (addressed in section 8.6)
3. Is the performance of the children with language impairment on the verb inflections significantly different from their younger typically-developing population? (addressed in section 8.7)

These questions along with the other findings of the study are discussed in the following sections.

8.1 Accuracy of the Forms

The performance of the typically-developing children on the three tasks showed that the Present Simple form was acquired with the highest accuracy (88%) which was then followed by the Present Progressive (67%) and the Past Progressive scores (44%) respectively. A repeated measures ANOVA revealed a significant difference in the degree of accuracy among

the markers across the participating children. There could be several explanations for this order of acquisition.

First, the Present Simple form is the simplest in terms of grammatical complexity. The form contains only one bound morpheme, i. e. a person marker; the tense or the aspect marker is not realised on the verb stem in this form. On the other hand, the Present Progressive and the Past Progressive forms, in addition to the person marker, require an aspect marker, and both the aspect and the tense markers respectively. Therefore, there is likely to be some merit in an interpretation based on structural/grammatical complexity. Language acquisition has previously been found to be governed by the 'naturalness principle'; Italian child data showed that, across different categories, least marked forms were mastered early on (Noccetti, 2003). Also, both tense and aspect markers have been discussed in a range of studies as having posed challenges for children (e.g. Bittner, 2003; Fletcher, Leonard, Stokes, & Wong, 2005; Leonard, Eyer, Bedore, & Grela, 1997; Leonard, Sabbadini, Leonard, & Volterra, 1987; Lustigman, 2012; Rice & Wexler, 1996). The facts that the Present Simple form does not contain either tense or aspect markers, and the Present Progressive form does not take a tense marker lead to a tenable interpretation of the order of acquisition of the verb forms.

Second, cognitive complexity is associated with the Past Progressive form, and a low accuracy rate was predicted for this form. Children's performance on language tasks or their production of language forms in spontaneous language samples are commonly found to be regulated by the cognitive complexities of the forms (e.g. Aksu, 1978). The task to elicit the Past Progressive forms had certain cognitive prerequisites such as conceptualising an ongoing event in past time, comprehending the brief story preceding each stimulus and making inferences.

The results obtained from this task surely reflect children's inability to supply the form, but children's performance could also be partially attributed to their inability to comprehend the task. However, the use of the Past Progressive form in real life is likely to pose similar challenges for children. Therefore, the task was not considered to be developmentally inappropriate. The cognitive challenges that may have been an impediment for some children while performing the task could be the reason why they may not have mastered the form yet. The Past Progressive form, with its structural and cognitive properties, can be considered one of the complex verb constructions in Bangla. This is possibly one of the reasons why children often replaced this form with substitutes that were structurally simpler in terms of one or more features.

Third, there may be other important factors that determined the order of acquisition of these forms. For instance, children's performance, in principle, should also reflect the language input to which they are exposed. The role of input has often been examined and emphasised in children's morphosyntactic development (e.g. Finneran & Leonard, 2010; Hadley, Rispoli, Fitzgerald, & Bahnsen, 2011; Xanthos et al., 2011). Children's use of the markers is likely to be a reflection of how they are used in the language environment of the children, given the grammatical and contextual scope of the markers. The Present Simple form holds an advantageous position in Bangla with regard to morphosyntax and use. Interestingly, this form is very pervasive in Bangla because it is often used in other linguistic contexts; it is permissible in Bangla to use the Present Simple form in the Present Progressive contexts. This allows for a strong prevalence of this form in the language environment. Additionally, although not measured in this study, observational data from children's language samples in the present

study seem to suggest that the Present Simple form is one of the frequent forms that young Bangla-speaking children largely resort to. Future studies should attempt to examine this through direct measurement. It is not clear at this stage whether the early mastery of the Present Simple form is due to its structural simplicity or the rich exposure to this form. The present study does not capture any information about the language input to which children were exposed. Systematic data on the children's language environment is needed in order to tease apart the contributions of the two factors.

Although the accuracy scores revealed a clear difference in success of use across children's performance on the three tasks, it is possible that the structural and the contextual properties of the forms cease to influence children's performance once a certain level of mastery is achieved. This suggestion is motivated by the finding that no significant difference between scores was found for the most proficient group, i.e. Group 3, in the Present Progressive and the Past Progressive tasks. However, even in Group 3, the Present Simple accuracy rate was still significantly higher than the other two. This is likely to be caused by the exceptional advantages associated with the Present Simple form. It is possible that with older children the same tasks would not reveal any difference in performance; all children would have very high accuracy rates across the forms.

8.2 Crosslinguistic Comparison of Accuracy

Crosslinguistic findings reveal that typological factors play pivotal roles in children's language performance. Studies in languages with agglutinative features have reported exceptionally high rates of accuracy of the verb inflections (Aksu-Koc & Slobin; 1985, Turkish;

Chakraborty & Leonard, 2012, Bangla; Raghavendra & Leonard, 1989, Tamil). A crosslinguistic comparison (Xanthos et al., 2011) across typologically different languages revealed results in favour of acquiring agglutinative languages, compared to fusional languages, i.e. the Turkish child recruited in the study was clearly ahead of the other children with the fastest rate of development. In a study on the development of verbal inflections, Tamil two-year-olds were reported to have no less than 73% accuracy in the verb markers involving, tense, aspect, person and gender (Raghavendra & Leonard, 1989). On the contrary, Brown (1973) reported only less than 50% accuracy even for, arguably, the earliest verb inflection, i.e. the progressive *-ing*, for an English-speaking child at age two. Aksu-Koc and Slobin (1985) found productive and almost error-free use of the verb markers among Turkish-speaking children by the age of two years. Agglutinative languages, as often stated in literature, are especially facilitative for acquisition due to some of their morphosyntactic properties such as regularity of the paradigm and proximity between the stem and the markers (Aksu-Koc & Slobin; 1985), and therefore the agglutination of the target language contributes to the high accuracy rates. Also, in agglutinative languages, as opposed to fusional languages, each morpheme is associated with a single function which increases the consistency in the language as well as enhancing the exposure to the individual morphemes. For example, since in Italian a morpheme is associated with more than one dimension of grammatical properties (e.g. number and person), the morpheme appears only when both dimensions are met. On the other hand, in an agglutinative language a grammatical marker appears, irrespective of the other dimensions, whenever the associated function is warranted. As a result, the property of agglutination is facilitative for building the morphological paradigm (Pinker, 1984). However, all of the findings described

above emerged from spontaneous sample analysis, not from experimental data, and therefore, they are significantly different from the present study with regard to the assessment tools. Spontaneous language samples are generally recognised to yield higher accuracy rates than structured probes (e. g. Leonard, Caselli, & Devescovi, 2002). These accuracy scores are, therefore, not readily comparable to the accuracy scores obtained from the present study on Bangla.

Studies with methodological parameters comparable to the present study are few. Table 8.1 presents children's accuracy scores on verb inflections in Italian and English along with those found in the present study on Bangla. These scores were obtained from language probes. Although not an agglutinative language, the Italian data showed very high accuracy rates compared with Bangla. However, the Italian verb inflections reported here are mostly agreement markers in the present indicative forms, and do not necessarily test children's mastery of tense or aspect. The English inflections presented in the table, on the other hand, express temporal (both tense and aspect) and agreement information. Even though the children who participated in the English study are significantly older than those recruited in the present study, the accuracy scores are somewhat lower than those found in Bangla. However, for the English data it could be argued that Berko's study (1958) was characteristically distinct from the conventional language probes which might have contributed to the results. Therefore, the data available is inadequate to evaluate the proposition that the agglutinative features of Bangla have contributed to the present findings.

Table 8.1

Accuracy scores (%) of verb inflections in Italian^a, English^b and Bangla

Language	Italian (2;5- 4;1)	English (4;0-5;0)	Bangla (1;11- 4;3)
First person Singular	90.85	-	-
First person Plural	81.78	-	-
Third person singular	99.17	-	-
Third person plural	91.39	-	-
Present Progressive	-	72	-
Past regular	-	55.2	-
Third Person Regular	-	52	-
Present Simple	-	-	88.33
Present Progressive	-	-	67.19
Past Progressive	-	-	43.59

Note. English and Italian scores are calculated from the original as needed.

^a Italian data from Leonard, Caselli, & Devescovi, 2002

^b English data from Berko, 1958

However, a recent study on Bangla (Chakraborty & Leonard, 2012) makes an interesting comparison to the present study. The study, with a set of experimental language tasks, concentrated on similar verb forms in Bangla and recruited children of the same age range (2;0-4;0). The study reported data from 19 children that indicated a much higher rate of accuracy, especially for the third singular Past Progressive form (84%), than found in the present study. Interestingly, a two-year-old child was also found to have 100% accuracy in the third singular Past Progressive form and the lowest score achieved by any child on this form was 54%. On the contrary, 36% of the children in the present study failed to produce any correct form in the Past Progressive task. Given the similarities in the selected verb stems, testing tools and the scoring

criteria, the discrepancy is intriguing, and it is not evident what might have caused a disparity to this degree. However, Chakraborty and Leonard's (2012) study was conducted in a different Bangla-speaking context, i.e. Kolkata, India. Although there is no known impact of the contextual differences with regard to the verb forms tested in the present study, dialectal issues may have played a role in causing the discrepancy in performances. This issue needs further exploration for confirmation regarding the possible contributions of any dialectal differences.

8.3 On the Errors

8.3.1 Errors are near-misses. Children's errors manifest typological properties of the ambient language. Therefore, investigations of the non-target forms across a variety of languages have resulted in diverse patterns of language development. Child data in English and German presented nonfinite verb forms as errors (Poeppl & Wexler, 1993; Wexler, 1994), whereas those in Italian, Spanish and Hungarian showed substitution by other finite forms (Leonard, Caselli, & Devescovi, 2002; Lukács, Leonard, Kas, & Pléh, 2009). Contributions from morphologically rich null-subject languages (Italian and Hungarian) suggested that children's errors are finite forms that differ from the target forms on just one dimension. Children speaking these languages were typically found to supply substitutions such as third person singular present for third person plural present and third person singular present for first person singular present forms. Results from Bangla, a null-subject language with fairly rich morphological properties, seem to follow this pattern. For the Present Progressive, the dominant error pattern was substitution by the Present Simple form, and for the Past

Progressive form, a common substitution pattern was the use of the Present Progressive form. Both substitutes deviated from the target forms by one dimension only; the former substitute missed the aspect marker, whereas the latter missed the tense marker. In both contexts, children were largely correct in agreement marking. Even in their imperfect responses, children were found to respect certain morphological features. Although the prediction for errors in morphologically rich null-subject languages like Bangla was that near-misses would not necessarily exhibit preferences towards any marker, the Bangla data showed a clear preference for certain markers. This issue is discussed in section 8.4.

However, not all substitutions found in the present study were near-misses. A considerable number of children (mainly Group 1) supplied Present Simple forms in Past Progressive contexts. The Present Simple form differs from the Past Progressive form on two dimensions: aspect and tense. Therefore, these deviations cannot be termed 'near-misses'. This can be interpreted from various perspectives. It is possible that the idea of the 'near-misses' is, in fact, a matter of degree. Children attempt to supply all of the markers, but marker use may be compromised by resource restrictions. Therefore, children with good command over the grammatical markers are able to produce the target form, while less able children tend to miss one or more markers depending on their abilities. This proposition is consistent with the three groups found in the study. Group 1 with the 'least developed' children used the Present Simple form, whereas Group 2 used the Present Progressive form for the Past Progressive form. It seems justified to expect that very young children may not have the cognitive facilities to produce complex forms like the Present or the Past Progressive forms. Therefore, a stage where children make compromises in more than one feature appears tenable. Progress, here, refers to

approximating the target forms better than before. However, this pattern of gradually approximating the target forms has not been reported in other rich null-subject languages. This could be attributed to the methodological differences across the studies; probably the appropriate age group has not been explored with the appropriate verb forms; for example, had this study not involved the Past Progressive forms, most errors would have appeared as near-misses. Confirmation regarding whether the gradual approximation property is unique to Bangla data or whether this can also be found in similar languages requires crosslinguistic examination of the child data using the same methodological specifications.

Also worth mentioning is the fact that not all substitutions of the Past Progressive form by the Present Simple are errors on two dimensions. As reported previously, Bangla allows for using the Present Simple form for the Present Progressive, at least in the context of the present study. Therefore, this pattern of substitution was also found among children who were not necessarily the 'least developed'. Possibly a set of children used this form as a functional equivalent for the Present Progressive form. Therefore, a portion of the substitutions of the Past Progressive by the Present Simple forms still qualify as near-misses.

Another view to interpreting this particular substitution pattern, i.e. use of the Present Simple for the Past Progressive form, emerges from the proposition associated with the morphological richness hypothesis. Leonard and his colleagues proposed that if the errors appear as any form other than the 'near-misses', the substitutions are likely to have resulted from frequency effects (Kunnari et al., 2011; Lukács, Leonard, Kas, & Pléh, 2009). In other words, only highly frequent forms can alter the pattern of near-misses. Therefore, the

assumption is that retrieval is primarily driven by the similarity in features, and only high frequency forms may change the near-miss patterns due to their strength in the paradigm. As reported previously, the Present Simple form in Bangla seems to have an exceptionally wide scope which makes it very likely to also be highly frequent in the language. This interpretation of the substitution patterns is still consistent with the claims associated with near-misses.

8.3.2 Errors are finite non-target forms. Studies of language acquisition in a wide range of languages have discovered that children respect the parameters of their languages in their errors such that the typological uniqueness of a language is commonly reflected in children's errors. Phillips' analysis (2010) of child data in nine typologically different languages revealed that children's use of language forms was strictly governed by the properties of the target languages. Children speaking languages with fewer morphological details (English and Swedish) were found to use a high proportion of root infinitives, whereas such uses were very low among children speaking morphologically rich languages (Spanish, Italian and Hebrew). Bangla errors found in the present study were rarely nonfinite forms. Errors were finite forms even among the youngest children. Children's responses often lacked the right combination of inflection, but the verbs did not usually appear without any inflection. Therefore, nonfinite forms, or bare forms were not commonly observed in the present set of Bangla child data. This is consistent with the properties of Bangla and with crosslinguistic findings of similar languages. The bare verb form in Bangla does not occur very often in the language. The linguistic parameters of Bangla almost never allow verbs to appear alone. The bare verb form has a very restricted use; only in intimate- or inferior-honour used in imperative contexts do Bangla verbs appear in their bare forms. However, children of the age range studied here are not likely to have exposure to

this form. Therefore, they are likely to hypothesise that Bangla verbs have obligatory suffixes, and this may be why their errors have the surface forms of other inflected finite verb forms. Converging evidence emerges from Italian and Spanish data, two morphologically rich languages, where children's errors consisted of other inflected forms instead of bare forms (Johnson, 1995; Pizzuto & Caselli, 1992).

The absence of a root infinitive stage and children's use of inflected forms as errors are consistent with children's early use of verb forms in 'rich' languages. Languages that do not permit the use of uninflected forms are those in which children were found to produce inflected verbs from an early age. Japanese verbs are inflected in all contexts and the base forms are not permissible. Consistent with this linguistic property, the Japanese child data exhibited early use of verb inflections (Li & Shirai, 2000). Findings emerging from typologically similar languages such as Italian, Greek and Turkish are in line with this finding (Aksu-Koc, 1988; Pizzuto & Caselli, 1993; Stephany, 1981). However, there are suggestions that the early inflected forms are unanalyzed items and the production of these forms does not necessarily demonstrate children's understanding of the underlying system (Clahsen, Avelado, & Roca, 2002; Tomasello, 2003). The experimental design employed in this study tested one of the simplest and, presumably, earliest verb conjugations in Bangla. In the Present Simple task children were required to supply this form with different verb stems, therefore it can be stated that children were assessed on their productivity. Although this form achieved the highest accuracy comparatively, the accuracy rate was 69.6% among the youngest group (Group 1). It is possible that the moderate accuracy score in the elicitation task reflects young children's limited understanding of the system. However, it is anticipated that the same form will obtain a

considerably higher accuracy if it is examined in spontaneous language samples. Unlike elicitation tasks, in spontaneous play situations children are not often compelled to demonstrate their understanding of the morphological rules and exercise them in a variety of contexts.

The Bangla data further suggests that, contrary to proposals in some of the studies motivated from English and similar data (Poeppel & Wexler, 1993; Wexler, 1994), the extensive use of bare forms may not be especially significant. The shape of children's errors may largely be governed by the typological characteristics of any given language. Therefore in Bangla, children are rarely found to produce bare stems as early forms or as errors.

8.3.3 Are errors substitutions or omissions? The morphological analysis of Bangla verb forms indicates that the verb conjugation system is incremental. The obligatory marker, i.e. the person marker, takes the word-final position. Tense and aspect markers inserted, in various combinations, between the stem and the person marker can create a range of inflected verb forms. Because of the incremental system, the omission of a tense or aspect marker results in another legal verb form in Bangla. For instance, an omission of the aspect marker from the Present Progressive form creates the Present Simple counterpart. Therefore, a deviation such as this can be interpreted both as an omission of the aspect marker, or a substitution of the Present Progressive by the Present Simple form.

However, it can be argued that the errors appeared more like substitutions than omissions. The errors were omissions to the extent that there were omissions of certain markers. But the children never omitted to the extent of producing bare forms; rather the

outcomes were other legal, inflected forms. Every erroneous form was an inflected form that had attached less than the appropriate number of inflections to the stem. Crosslinguistic evidence of substitution by simpler counterparts of the target forms are common (e.g. Aksu-Koc, 1988; Pizzuto & Caselli, 1993).

Irrespective of whether Bangla non-target forms found in the present study resulted from omission or substitution, it can be concluded that the linguistic boundaries were maintained even in errors. Children never omitted the markers to the extent of producing a form that is not ‘allowed’ in the language, nor did they substitute the target form with an ‘illegal’ form. This choice is very likely to be driven by the fact that the bare form of verbs in Bangla has a very specific use to which children are not likely to be exposed. On the contrary, the use of bare forms among young children is ubiquitous in languages that permit such use (e.g. Poeppel & Wexler, 1993, German; Wexler, 1994, English). Therefore, it appears that while the ability to use a target form may be restricted among children, what children eventually produce in accurate forms or in errors is strictly regulated by what is available in the ambient language.

8.4 Hierarchy among Markers

It was anticipated that children would exhibit difficulties with tense and aspect markers. Bangla verbs are marked independently for tense and aspect which makes it ideal for testing these markers. Unlike Bangla, in some languages a direct assessment of tense and aspect markers is difficult because in those languages sometimes both markers are encoded in one form, e.g. past *-ed* in English. In Bangla, tense and aspect markers are used independently, i. e.

one can be present with or without the other. Any combination from no tense, and no aspect markers to the presence of both is legal in Bangla; for example, absence of both is typically observed in the Present Simple form, whereas both markers are present in the Past Progressive form. In addition, points between these two ends can be found in the Present Progressive or Present Perfect form (aspect without tense marker), and in the Past Simple form (tense without aspect marker). Some crosslinguistic studies of typical and atypical development have revealed an emergence of grammatical aspect markers prior to tense markers and identified tense to be the challenging area (Brown, 1973; Leonard, Sabbadini, Leonard, & Volterra, 1987; Rice, Noll, & Grimm, 1997; Stephany, 1981), whereas some reported difficulties in aspect marking itself (Fletcher, Leonard, Stokes, & Wong, 2005; Leonard, Lukács, & Kas, 2012).

Findings from the present study showed that in Bangla, children's errors contained deviation in both tense and aspect marking. While producing the Past Progressive forms that required both tense and aspect markers (also person markers), the youngest and the least developed group (Group 1) often failed to mark both which resulted in substitution by the Present Simple form. However, children's preferences were evident when they substituted the Past Progressive form with the Present Progressive form. Note that the latter contained an aspect marker but no tense marker. Children's production of the correct aspect marker along with the absence of the tense marker appears consistent with the 'grammatical aspect before tense' proposal suggested previously. This seems tenable in Bangla also because aspect markers are more prevalent than tense markers in Bangla. The past tense marker is realized in the Past Simple, Past Progressive and Past Perfective forms. Except for the Past Simple, the other two past forms also take aspect markers. Moreover, as reported in the chapter on the

pilot study, the scope of the Past Simple form is restricted and it is often replaced by a more prevalent form in Bangla, i.e. the Present Perfect. The Present Progressive and the Present Perfect forms, interestingly, take aspect markers without a tense marker, and as reported above, the Present Perfect has a wide scope in past contexts in general. Therefore, the distributional patterns of tense and aspect markers in Bangla support the possible emergence of aspect markers before the tense marker in Bangla. A similar interpretation was forwarded for Hebrew-speaking children's use of the tense marker prior to the person marker (Armon-Lotem & Berman, 2003).

Also, aspect markers in Bangla are likely to appear to be more important to children for another reason. Bangla aspect markers are often syllabic and sometimes even disyllabic (Past Progressive aspect in colloquial Bangla, Table 3.3). Therefore, they are salient in the language (discussed further in section 8.8.2). On the other hand, tense markers in Bangla, i. e. *-l-* (past) and *-b-* (future, not discussed here), are non-syllabic. Their lower perceptual salience is likely to contribute towards later emergence of the markers (cf. Leonard, 2014a).

Another perspective for examining the status of these two markers is to assume that both aspect and tense markers as morphological features have equal weights and they are at the same difficulty level for Bangla-speaking children. Therefore, what children eventually produce in their errors is simply a mismatch vis-à-vis one or more features. However, even within this view, there is room for arguing that aspect markers in Bangla are earlier in the developmental sequence than tense markers. If children, due to limited facilities, are unable to mark all the features, why do they mark aspect markers and drop tense markers consistently? If

there were no priorities among the markers, then children, at least sometimes, would produce the Past Simple form (that contains a tense marker without an aspect marker) as a substitute for the Past Progressive form. If all verb inflections carried the same weight, then any combination of tense and aspect markers would have been observed in children's errors. But this was not the case; when the errors deviated by one marker, it was typically the tense marker that was incorrect. Therefore, based on Bangla-speaking children's clear preference for aspect markers, it seems tenable to posit that the scope of a morphological marker, as regulated by the language, largely dictates the emergence and status of that marker.

Bangla person markers were not examined separately in this study due to the length concerns regarding the tasks. Bangla person markers are always the final inflections added to verb stems, and they are always syllabic. In neutral-honour forms, except for Past Simple situations, they are realized in single vowel sounds (e.g. *-e*, *-o*, and *-i*). Therefore, their physical and contextual properties lead to the assumption that these markers are not likely to pose challenges to children. In addition, the distributional pattern of the verb markers indicates that person marker is the most pervasive and the only obligatory inflection required in a finite verb form (second person imperative in 'intimate' honour is an exception). Depending on structural demands, verb stems can appear without a tense or an aspect marker; but a person marker is almost indispensable. This may lead to the rise of the person markers in a possible hierarchy among the verb inflections. Armon-Lotem and Berman (2003) forwarded a similar interpretation for tense marker preceding person markers among Hebrew-speaking children. In Hebrew, they reported, a person marker is optional whereas tense is always marked. These considerations lead to the assumption that the distributional properties of Bangla person

markers in comparison with the other verb markers may place them in an advantageous position for the purpose of acquisition. Finally, although person markers were not tested separately in the present study, findings suggested that children's error patterns did not commonly centre around person markers. Also noteworthy is the fact that some of the substitutions children made in the tasks required some alterations in the person marker as well. The two common substitutions for the Past Progressive form were the Present Simple and the Present Progressive forms. In both standard and colloquial Bangla, the required person marker is *-o* in the Past Progressive form, whereas it is *-e* in both the Present Simple and Present Progressive forms (Table 3.3). Use of the latter two forms with their corresponding person markers in place of the Past Progressive form points to a possible early mastery of this form in Bangla.

However, Bangla person markers still require close examination. Although the present study did not reveal any pattern with regard to person markers, the use of inappropriate person markers was noted among young children (2;2 and 2;3) in the pilot study. The inaccuracies found in the pilot study were the use of the first person for the second person marker, and the use of the third person for the first person marker (one instance in each case). The third person marker was never noted to be replaced by any other person marker. This finding does not necessarily contradict the error-free use of person markers in the main study. Note that the tasks employed in the main study required production of the third person marker only. It is possible that the third person marker is relatively easier than the other two. Results consistent with this possibility were reported for Spanish and Italian children (Bedore & Leonard, 2001; Leonard, Caselli, & Devescovi, 2002). These studies found that the third person

markers commonly replaced the corresponding first person markers. Also, Chakraborty and Leonard (2012) reported significantly low accuracy rate for the second person verb forms both in present and past situations. In both contexts, the second person forms were replaced by either their first or third person counterparts. This is in line with several crosslinguistic findings (e.g. Bassano, Maillachon, Klampfer, & Dressler, 2001; Stephany, 1997). However, Chakraborty and Leonard (2012) also posited that the use of the non-target markers in the second person contexts could be an artifact of their experimental task.

Therefore, it is possible that although person markers emerge early, the status of all person markers in Bangla is not the same with regard to acquisition. Future investigations involving person marker contrasts should obtain interesting insights of Bangla person markers.

8.5 Three Groups/ Stages

Based on the accuracy scores and the error patterns found on the three tasks, three distinct groups of children were identified. They had well-defined linguistic characteristics reflected in their accuracy scores and in their errors. The 'least developed' group, Group 1, had mastered only the Present Simple form and this form, by and large, replaced the other two forms in the tasks. Group 2 had high accuracy scores both in the Present Simple and the Present Progressive forms and in the absence of a Past Progressive form, the Present Progressive was substituted for the target form. Finally, Group 3 had high accuracy across the forms, and the substitution rates were low. Based on the accuracy scores discussed earlier and the three groups identified, the following order of acquisition for the three forms is proposed: Present Simple -> Present Progressive -> Past Progressive. The order indicates that a Bangla-speaking

child is likely to advance through these stages. It is likely that the Present Simple will be mastered the earliest, which will be followed by the Present Progressive and the Past Progressive forms respectively.

The order of acquisition is convincing given the linguistic and contextual properties associated with the forms. The order is consistent with the structural complexities of the forms; the simplest form appears to be acquired first and the most complex form is acquired last. As discussed earlier, the Present Simple form is hypothesised to have an enhanced representation in children's cognition because of its exceptionally wide linguistic scope. On the other hand, the Past Progressive form presents certain cognitive demands for users, and due to the specificity of the Past Progressive contexts, this form naturally has limited linguistic opportunities to occur, in comparison with the others.

The error patterns across the groups present interesting opportunities for insights into language development. When children were least developed (Group 1), the use of the Present Simple form was extensive. Children produced this form in appropriate contexts as well as in contexts where other more complex forms were required. Evidence of this, of children's channeling known forms towards other contexts, is commonly found in the literature (e.g. Lakshmanan, 2006; Lustigman, 2012). The groups also showed clear shifts within the error patterns. For instance, when children mastered the Present Progressive form, which presumably is available at a higher developmental stage, they ceased to use the Present Simple form and chose the newly mastered form as a substitute for the Past Progressive. The shift in the error pattern is in line with children's accuracy scores. With advancement in mastery of the

forms, children's errors also became more sophisticated. In other words, children's developmental progress was also manifest in errors.

However, the groups were not necessarily distinct when the distribution of the other measures across the groups was examined. Group 1 was not only younger than the other groups, but was clearly less advanced in terms of MLUadj, Word Type and Bound Morpheme Type. However, although the mean values of Group 2 were lower than Group 3 across all the measures, the scores were not significantly different. Therefore, it appears that the only indices that differentiated these two groups were children's accuracy of the Past Progressive form and an associated index, i.e. their substitution of the Past Progressive by the Present Progressive form.

A possible explanation for the apparent similarities between the groups can be suggested. Note that the measures that did not bring out the differences between Group 2 and 3 tend to plateau after a certain point in development (cf. Fletcher, Leung, Stokes, & Weizman, 2000). A continual progress on indices such as MLU or Word Type may not be observed throughout the developmental period. One possibility could be that growth slows down after stage 2 (Group 2) with regard to these indices. However, note that the two groups are also similar in age. If the previous explanation was justified, then Group 3 should have contained children who are considerably older than Group 2, indicating an ongoing chronological progress. But this is not the case. The two groups are uniform in their ages. This points towards a possible difference in progress rate among children and the lack of an absolute association between language development and age. It is possible that within the same age range, some children are able to accomplish certain linguistic milestones which others cannot. The Past

Progressive form in Bangla, as reported earlier, is possibly the most structurally complex of the forms and exposure to this form is also likely to be restricted. Children of the same age with similar scores in a set of other linguistic indices may differ in their mastery of the Past progressive form, which is arguably at an exceptionally high level of difficulty. Therefore, it is likely that Group 3 consists of children who have advanced language ability relative to their peers.

8.6 Determinants of Test Scores

One of the objectives of the study was to determine whether or not MLU was a better predictor of children's language performance (demonstrated in the test scores) than Age. Although Age is not considered as strong a predictor of language development as MLU (Brown, 1973), in the present study Age by and large was found to have a stronger association with the scores than MLU (MLUadj). However, the difference between the correlation scores was not striking; the Pearson's correlation scores ranged from .48 to .58 among the predictors and the accuracy scores.

MLU as an index of children's morphosyntactic skills is reported to be unreliable (Johnston, 2001; Klee & Fitzgerald, 1985). With a certain degree of mastery in the language, children become flexible with their conversational skills. Therefore, often what is captured in the MLU value is more a reflection of the nature of the conversation than the child's grammatical skills (Brown, 1973). Moreover, the MLU value is likely to often mask the qualitative differences between children's abilities (Cazden, 1968). In order to reduce the effect of the limitations associated with MLU measurement, an adjusted MLU score (MLUadj) was used in the present study. However, the adjustment, at best, only refines the scores to some

degree; it does not make the scores reliable. In addition, in null-subject languages the MLU scores need to be interpreted more cautiously. Null-subject languages allow a certain amount of flexibility which is likely to contribute to the length of children's utterances, which may explain why the MLUadj measure in the present study did not obtain a very strong relationship with the test scores. However, it is not clear why MLUadj did not have a considerably stronger association with the accuracy scores than did Age.

The present study also examined a relatively less-explored measure as a determinant of language development, i.e. the number of bound morpheme types (BMT) (cf. Klee & Fitzgerald, 1985). This measure was thought to be a good indicator of grammatical diversity exhibited by children because it was assumed that children who had mastered more bound morphemes, i.e. were linguistically more advanced, would supply a wider range of bound morphemes in spontaneous speech. Through the correlation and regression coefficients, this index clearly demonstrated the highest association with all of the accuracy scores. In a hierarchical regression model, this variable was found to contribute significantly in explaining additional variance in the Present Simple and the Present Progressive scores even beyond the effect of Age and MLUadj. However, BMT is not a global score; the measure is not representative of all language items produced. Yet it appears to be free from the limitations associated with MLU measurements. Therefore, BMT is recommended, not as a global index of language proficiency, but as an indicator of children's morphosyntactic skills.

8.7 Results of the LI Group

The children with language difficulties assessed in the present study varied in terms of their ages and the broad range of diagnostic labels applied to them. The rationale behind this was that research on SLI had not made significant progress in Bangla and there was no reliably identifiable population of SLI in Bangladesh. Therefore, a group of children affected by an array of linguistic and cognitive challenges was recruited for the study. In a similar context, in Turkey, where advanced research on language impairment had not been conducted, a mixed group of children with LI were examined to gain an overview of language impairment in Turkish (Acarlar & Johnston, 2011).

Analyses similar to those of the TD group were also performed on the data of children in this group. A set of one-way ANOVAs run between the test scores of the two groups showed that children with LI performed at significantly lower levels than the typically-developing younger children on all three tasks. They were also found to have significantly lower scores on the other language measures such as MLUadj, Word Type and Bound Morpheme Type. The differences in performance between the two groups are consistent with crosslinguistic findings on language impairment that have revealed that children with language difficulties perform poorly on a range of linguistic measures compared to older typically-developing children (e.g. Acarlar & Johnston, 2011; Fletcher, Leonard, Stokes, & Wong, 2005; Leonard, Hansson, Nettelbladt, & Deevy, 2004; Lukács, Leonard, Kas, & Pléh, 2009). However, studies across a variety of languages found that the structural or the surface properties of the ambient language plays a role in the manifestation of LI in that language (cf. Leonard, 2014b). The contribution of

morphological richness to the performance of Bangla-speaking children with language difficulties can be examined with data from a larger group of children with LI and with a crosslinguistically comparable research design.

The mean accuracy scores of the children in this group indicated that the moderate accuracy in the Present Simple form (53%) was the highest score of the LI children; both the Present Progressive and Past Progressive scores were considerably lower (28% and 9%). The scores suggested that the order of acquisition of the three verb forms was likely to be the same for children with LI as the TD children. The LI group was also similar to the TD group with regard to the error patterns in the tasks. Their choices for substitutions of the target verb forms were consistent with those of the TD group. The Present Simple form, possibly being the simplest verb form, did not have substitutes other than the errors of the 'other category' comprising of 'no responses', noun responses, imitation, unclear and meaningless responses. On the other hand, the Present Progressive and the Past Progressive, as found among the TD children, were commonly substituted by their simpler counterparts. The uniformity between the two groups in terms of the order of acquisition and the error patterns indicates that despite compromised language skills, children with LI possibly maintain the same underlying principles as the younger TD children.

The discriminant function analysis identified the level of development of the children in the LI group and also compared them to each of the three TD groups (identified from the cluster analysis). The comparison showed that three children were consistent with Group 1 of the TD children. That is, three of the nine LI children showed similar accuracy and error patterns as the least developing TD group. There was one child who assimilated with Group 2 and

another who assimilated with Group 3. The distribution of the LI children across different levels of typical development suggests the LI group recruited in the study varied in terms of their language abilities. It is likely that the diverse nature of the group is not only due to the recruitment of a mixed group with a variety of clinical labels, but also due to the fact that language impairment itself reflects a heterogeneous problem and children even within the same category of language difficulty can vary depending on the degree of severity of the problem.

Interestingly, there were also four children in the LI group who the discriminant function analysis identified as distinct in terms of their accuracy scores and error patterns. Their language performances on the three elicitation tasks were not consistent with any proposed stage of typical development. This sub-group of children did not exhibit significantly higher accuracy in the Present Simple form (33%), arguably the simplest and the most ubiquitous verb conjugation in Bangla, than the Present Progressive form (33%). Moreover, while their accuracy rates in the Present Simple form were low, their use of the Present Progressive form as substitutes exceeded those of the Present Simple form as substitutes. According to the trends found for the TD children in this study, these patterns of language use appear to be unusual and they do not conform to the proposed developmental sequence for typical development. Note that the study recruited a mixed group of children affected by a set of related cognitive impairments. Given this and the fact that language impairment is an issue of degree, it is possible that the LI group included in the present study also contained a group of children who exhibited characteristics unusual to typical development. However, the present study is based on a small dataset and the findings are far from adequate to make conclusive remarks on

language impairment in Bangla. Further investigations are required, on both typical and atypical development, in order to glean a more reliable view of the nature of language impairment in Bangla.

8.8 Theories of Language Acquisition

Accounts of language acquisition described in Chapter One and Chapter Two explain children's language behaviours and make predictions about the course of language acquisition based on crosslinguistic research findings. Some of those proposals are purposely excluded from the following discussion. For instance, the missing feature or the rule deficit hypothesis (Gopnik, 1990a, 1990b; Gopnik & Crago, 1991) was not tenable vis-à-vis the crosslinguistic findings and it does not commonly appear in the acquisition literature anymore (Leonard, 2014a). Also, the evaluation of some of the proposals discussed earlier, namely the generalized slowing hypothesis and the auditory deficit hypothesis, are beyond the purview of the present study. The proposals that are deemed relevant for the Bangla study will be examined in the following section with reference to the present findings.

8.8.1 (Extended) Optional Infinitive and (Extended) Unique Checking Constraint. The Optional Infinitive (OI) account suggested that during the course of language development children arrive at a stage when they are aware of the requirement for tense marking but they hypothesise that the marking is not obligatory (Wexler, 1994). While typically-developing children outgrow the OI stage, children with language impairment spend a protracted period of time at this stage and sometimes never advance from there (Rice, Wexler, & Cleave, 1995). A defining characteristic of this stage is the omission of finiteness markers in children's

utterances; for example, omission of the third person singular *-s* and the past *-ed* in English. However, children's performance examined in the present study did not reveal any such pattern for Bangla development. Both typically- and atypically-developing children's errors were finite forms. Children rarely produced the bare verb stems. The findings indicate that the proposal of OI is not consistent with Bangla developmental data and the hypothesis regarding the optionality of finiteness marking is not confirmed as a universal developmental feature.

However, the OI hypothesis was revised based on the finding that omission of finiteness markers was not observed commonly in null-subject languages (e.g. Leonard, Caselli, & Devescovi, 2002; Bortolini & Leonard, 1996; Leonard & Dromi, 1994). Addressing the error patterns found in null-subject languages, Wexler (1998) proposed that an OI stage would not be found for children speaking null-subject language because production of utterances in these languages does not violate the Unique Checking Constraints (UCC) children have. The Bangla data from this study are in line with the observation that, typically, in null-subject languages errors are not nonfinite forms. The proposal concentrates mainly on explaining why children speaking null-subject languages do not exhibit properties of the OI stage. However, it does not make elaborate claims about how the errors will manifest in these languages. One of the claims made in the (Extended) Unique Checking Constraint about errors in null-subject languages is that because of the same constraint of marking only one feature, auxiliaries in null-subject languages will be challenging for typically-developing young children and children with language impairment. The limitation, according to the proposal, is most likely to result in the omission of auxiliaries. This claim with regard to the use of auxiliaries cannot be examined from the present dataset since the target utterances did not contain auxiliaries in Bangla. Therefore,

although the use of finite verb forms among both groups of children was consistent with the UCC, the scope of the present study does not allow commenting on the specific claim about the use of auxiliaries in null-subject languages.

8.8.2 Surface hypothesis. As described previously, the surface hypothesis proposes that acquisition of grammatical inflections is regulated by the salience of their surface forms (Leonard, 2014a). Some of the Bangla inflections tested in this study, i. e. the aspect markers, are salient and often syllabic, while the tense marker is brief. The person markers are always syllabic and word-final components. According to the claims of the surface hypothesis, in Bangla, person and aspect markers are not expected to pose challenges for TD children or children with LI, whereas the tense marker, due to its brevity, should appear difficult for children. Although person markers were not tested, the error patterns did not reveal significant difficulties in using person markers. Moreover, both typically- and atypically-developing children showed preferences towards aspect markers over tense markers. Verb forms that required production of both aspect and tense markers were often replaced by forms that contained the target aspect markers without the tense marker. The results are consistent with the surface hypothesis and it is possible that the salience of the grammatical markers contributes to building the morphological paradigm. However, the surface forms of the grammatical markers do not seem to be sufficient as the determinant of mastering those markers, and the other external characteristics, i.e. frequency and distributional properties, as well as the cognitive properties of the markers, also seem to make significant contributions to the representation of the markers in the linguistic system.

8.8.3 Morphological richness account. According to this account, both TD children and children with LI speaking morphologically dense languages are expected to have high accuracy in their use of grammatical inflections. The present study found that children were able to produce finite forms from an early age; even the youngest group did not seem to have any difficulty in producing finite verb forms. The accuracy in some of the forms tested was remarkably high (Present Simple, 88%), while in others accuracy was moderate (Present Progressive, 67%; Past Progressive, 44%). However, whether these scores are ‘high’ or not is difficult to determine due to the inherent relativity associated with the notion of morphological richness. Also, another claim of the proposal was that there would not be a significant gap between the performances of the TD children and the children with LI speaking morphologically rich languages. The Bangla data from children with language impairment do not seem to conform to this claim. The differences between the two groups in the three language tasks were significant and the children with LI recruited in the study appeared considerably affected. However, even in the compromised productions, children with LI were also found to have mastered some markers; grammatical markers commonly accompanied their verb stems. Their accuracy rates were low because they did not seem to be able to produce the correct combination of the markers, not because the utterances lacked grammatical inflections. Due to the lack of specific measures of morphological richness, the merit of the proposal cannot be judged from the accuracy scores found in the present study. However, there are other more specific claims that can be examined.

Firstly, an important assumption of the proposal is that children speaking morphologically rich languages will exhibit ‘near-miss’ errors (Bedore & Leonard, 2001; Lukács,

Leonard, Kas, & Pléh, 2009). As discussed previously, the error patterns found in this study tends to conform to this claim. Bangla Present Progressive forms, most often, were erroneously substituted by the Present Simple forms and the Past Progressive forms were commonly substituted by the Present Progressive forms. However, mostly among young children, it was also common to replace the Past Progressive forms with the Present Simple forms which do not qualify as near-misses. This finding does not essentially refute the proposal since the proposal also posits that the near-miss patterns can be altered by high frequency forms. The Present Simple form is possibly one of the most frequently used verb conjugations, occurring in a wide range of linguistic contexts. Therefore, the error patterns seem to be consistent with this particular proposition of the morphological richness account.

Another corollary of the proposal is that no particular grammatical marker will have priority in children's performance, i.e. no one dimension should be particularly easy or compromised. The Italian data supporting this proposal showed that the choice of the substitutions was not in favour of any particular dimension of the marker; the third person singular form tended to replace the third person plural as well as the first person singular form (Leonard, Caselli, & Devescovi, 2002). However, the present study offers differing findings. Children's performance indicated clear preferences while using the two inflections, i.e. tense and aspect markers. In erroneous productions, tense markers commonly contained the errors. The Past Progressive Form (containing both tense and aspect markers) was replaced by the Present Progressive form (an aspect marker match) commonly, but never by the Past Simple form (a tense marker match). Children also rarely produced utterances in which the wrong person marker occurred, while tense and aspect markers were correct.

Therefore, the results obtained from the present study do not support the claim about the assumed absence of bias exhibited in the near-miss patterns. It is possible that, as recognised in the other claim about the near-miss pattern, i.e. the frequent forms may alter the near-miss patterns, the input and the contextual scope of the forms may also contribute to creating a bias among the choices of the non-target forms. It seems tenable that while selecting a substitute of the target form, some markers will be maintained more commonly over others.

8.8.4 Processing constraints. The assumption of this account is consistent with the developmental trends found among both typically- and atypically-developing groups. Both groups exhibited higher accuracy rates in the structurally simpler verb forms. Moreover, when replacing the target forms that were not yet mastered, children tended to use the simpler counterparts. Based on these findings it seems plausible to suggest that both typically- and atypically-developing children operate within processing limitations, possibly of different degrees. The findings may also be evidence for a gradual increase in processing capacities. This is evident from the differences in the accuracy rates and the choices of the substitutes found among Group 1 (youngest and least developed) and Group 2. It is possible that the processing constraints tend to relax over time, which manifests in a gradual growth in language.

Crosslinguistic findings of language acquisition have often been interpreted along the same lines (e.g. Dromi, Leonard, Adam, & Zadunaisky-Ehrlich, 1999; Lustigman, 2012). However, the present set of findings also indicates that in the face of processing limitations, language does not develop unsystematically; rather how the limitation will manifest is determined by what is available in the environment. Children with limited capacities are not likely to produce a compromised form of a language item that is not permissible by the language usage. In the

present study, neither TD children nor children with LI were found to produce bare verb stems in erroneous utterances even when the accuracy scores were low. Processing limitations may affect language performance of children to varying degrees but even in the presence of considerable limitations the underlying principles of the ambient language are maintained. Therefore, when a Present Simple form is produced instead of the Past Progressive form in Bangla, the capacities exhibited in the Present Simple form are not comparable to those exhibited in the production of a bare stem in English. It is likely that the processing constraints manifest in relatively compromised language performances do not necessarily lead to the production of the same surface forms.

Therefore, an examination of some of the proposals of language acquisition with regard to the present set of data suggests that the Bangla data are consistent with the surface hypothesis, morphological richness account (partially), and the processing constraints account, and do not necessarily refute the hypothesis on EOI since the proposal has been revised.

8.9 Limitations of the Present Study

The present study was conducted within a range of limitations. First, during the conceptualisation stage of the study, no previous literature was available on Bangla that could provide directions to design the present study. Therefore, precedents in other languages were considered for determining the specifications of the present study, which might not be ideal considering the impact of the typological factors on language acquisition. Second, as mentioned previously, both the TD and the LI populations were recruited on the bases of crude criteria; there were no formal screening procedure involving standardised tests that determined the

recruitment of the children. The TD children within the target age range were recruited based on their parents' confirmations about the absence of any medical condition and concern regarding the children's speech, language and hearing (see Appendix A for the complete parent questionnaire). The recruitment of the children with LI relied completely on the previous assessments made by the special school or the referring doctors. Also, a heterogeneous group of children with LI were recruited in the present study in want of an identified population of children with SLI. In both cases, the recruitment suffered due to the unavailability of the research instruments, i.e. language-specific guidelines, and testing tools in Bangla. Third, although a native-speaker's confirmation was obtained, it could not be ensured that the verbs employed in the elicitation tasks were actually early-emerging for Bangla-speaking children. There was no available database of the early verbs in Bangla. Therefore, studies on the early verbs in other languages were consulted before selecting the verbs for the present study (Cross Linguistic Lexical Norms, 2012). Finally, the sizes of the groups of participants also suffered from some limitations. Parents in Dhaka, Bangladesh are not commonly approached for participating in such studies. Therefore, some of the parents who were invited in the present study were skeptical about participating. Also, although interested, some daycare centres could not offer the space and time required of them to administer the tasks with the children. These practical constraints resulted in a smaller group of participants.

8.10 Future Investigations

The present study aimed to examine the development of the grammatical markers associated with three verb forms: the Present Simple, the Present Progressive and the Past

Progressive. As the one of the early studies on Bangla, the present project could not include study of all of the important properties of Bangla. Based on the findings of the present study, future investigations should attempt to address the following issues.

Language input, as an external factor affecting language development, is likely to make significant contributions to how grammatical markers are mastered by children. However, due to practical constraints the present project did not capture a representation of the input to which children were exposed. A follow up study examining the contribution of the language environment of the children is likely to offer interesting insights.

Children's performances on the three experimental tests were not bimodal. Children were at different data points between zero to 100% accuracy on each task. An interesting investigation would be to identify what determined the 'partial' success. Evidence of 'partial' success is commonplace in language acquisition. Given this tendency, are there determinants that work in favour of or against some language items? For example, some verb stems may be structurally easier than others that may have facilitated the acquisition of those forms. Also, some verb stems may be more frequent in the language environment, or a stem may co-occur more often with a particular inflection relative to others that may increase their strength in the paradigm.

Children's performances on using the person markers did not raise any concerns in the present study. However, as reported earlier, studies of other morphologically complex languages suggest otherwise. It is also possible that some person markers are more challenging

than others. Therefore, children's use of the Bangla person markers needs to be examined separately.

Finally, a possible venture with regard to atypical development would be to administer an equivalent set of language tasks with a larger and more uniform group of children in terms of the nature of impairment and their ages in order to confirm the developmental trends. The investigations, later, can be expanded to other areas of language to obtain a composite profile of language abilities and difficulties of relatively distinct groups of children with language impairment.

8.11 Summary and Final Words

The present study investigated the morphosyntactic development of Bangla-speaking pre-school children with regard to using three verb forms, namely the Present Simple, the Present Progressive and the Past progressive, and examined a small group of children with language impairment vis-à-vis typical development. The results identified a possible developmental sequence for the three target forms and revealed children's use of language prior to mastery of the forms. The study also identified that the verb inflections examined were significantly affected among the LI children who, however, were remarkably similar to the TD children in their language use in errors.

The study, with regard to its findings, discussed the issue of agglutination and structural complexity in mastering the verb forms. There is a possible hierarchy among the grammatical inflections that is likely to be regulated by the contextual properties of the markers. The study, by presenting results from a language with agglutinative properties, confirmed and

substantiated the contributions of typological factors in language development. Finally, some of the current proposals of typical and atypical language acquisition are evaluated within the scope of the present study.

Although conducted within methodological limitations, the present study is deemed significant for both enhancing representation of Bangla in crosslinguistic acquisition studies as well as laying the groundwork for language acquisition research in the Bangla-speaking contexts. The study is valuable in that it presents results from a language that is studied rarely but is spoken by a large population. Therefore, advancement in Bangla research is likely to bring amelioration for a large number of people, particularly when clinical interventions arise from developmental studies. To conclude, the study noted the importance as well as the constraints of conducting studies in novel linguistic contexts which may inspire and guide acquisition studies in other less-explored languages.

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Appendices

Appendix A

Parent questionnaire (A Bangla version of the document was given to the parents.)



**Early Morphological
Development of Typically and
Atypically Developing Bangla-
speaking preschool children**



Questionnaire

Parent's name _____

Child's name _____

Mother/ Caregiver's educational qualification _____

Child's date of birth _____ Telephone number _____

Address _____

Postcode: _____ Email: _____

What is the best way to contact you? Phone ☐ Email ☐ Mail ☐

What is the sex of your child? Male ☐ Female ☐

Birth order of your child: 1st born ☐ 2nd born ☐ 3+rd born ☐

How many children do you have? ☐

Was your child born prematurely? Yes by ☐ weeks No ☐

Does your child have any significant medical conditions? Yes ☐ No ☐

If yes, what medical conditions does your child have? _____

Do you have any concern about your child's speech, language or hearing? Yes ☐ No ☐

If yes, what concerns do you have? _____

Has anyone in your family had a speech or language delay or disorder? Yes ☐ No ☐

What language(s) is (are) spoken in your household? _____

Is Bangla your child's first language? Yes ☐ No ☐

Does your child speak or hear any other language(s)? Yes ☐ No ☐

If yes, then

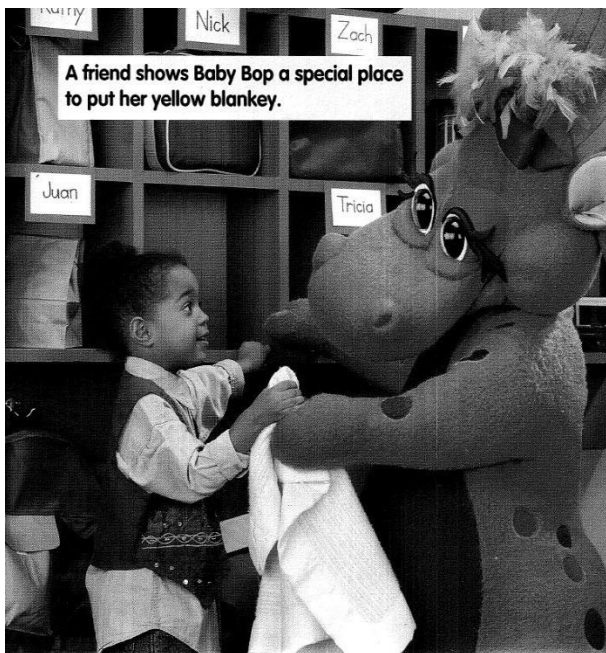
- a) please mention which language(s) your child speaks/hears (other than Bangla)

- b) please mention in what situations you child speaks/hears those languages (e.g. from parents, relatives, on television etc.)

Thank you.

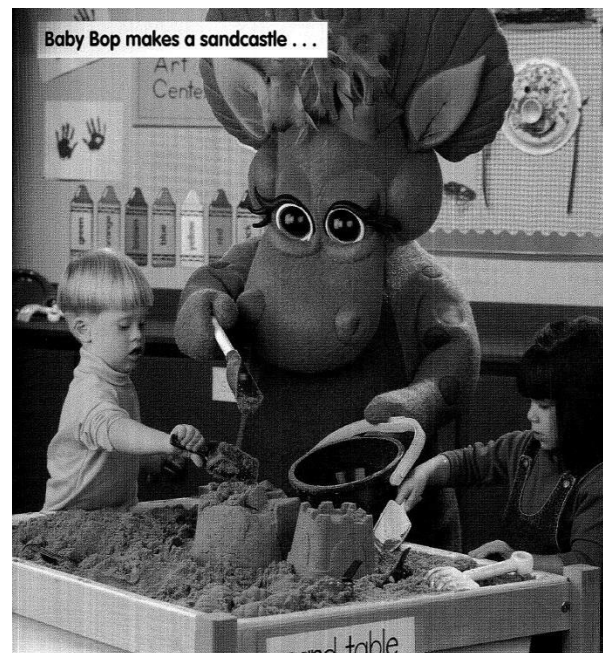
Appendix B

Picture stimuli for the present progressive task



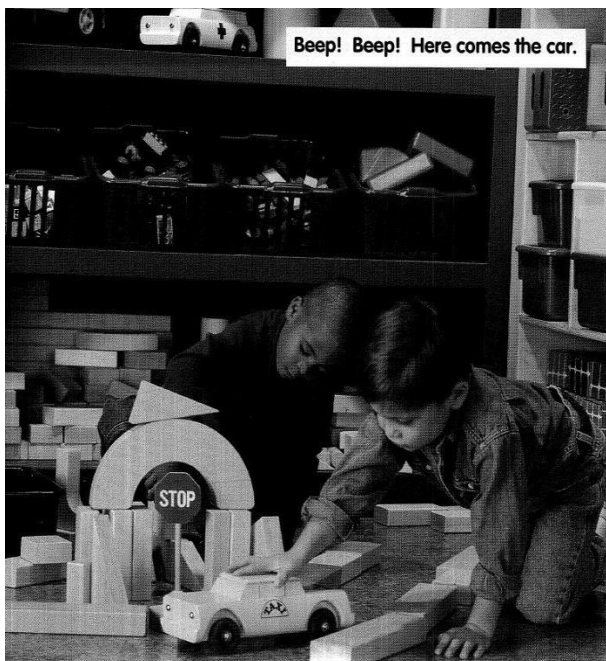
Trial item 1

Verb stem: /di-/ (to give)

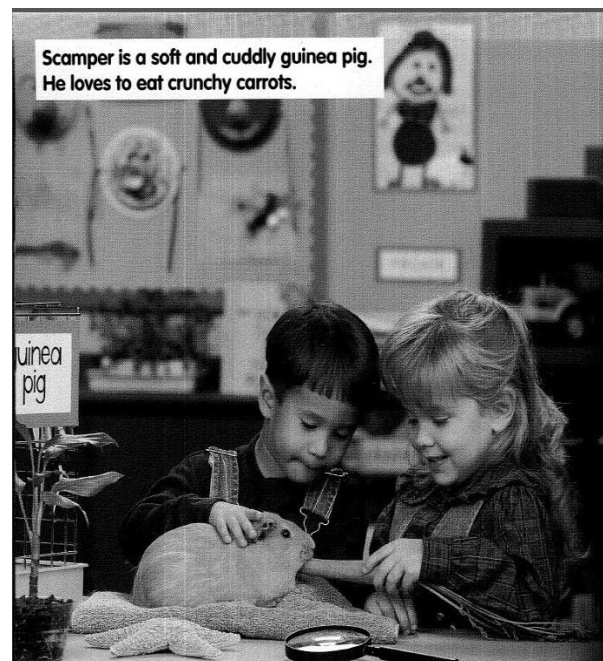


Trial item 2

Verb stem: /bana-/ (to make)

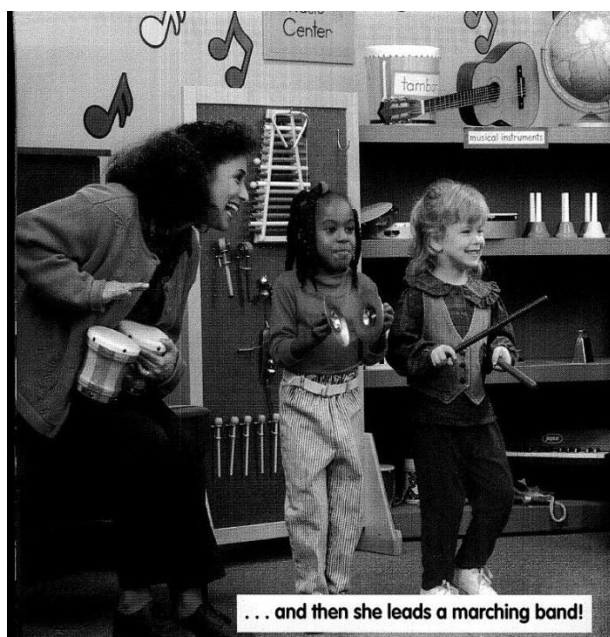


Test item 1

Verb stem: /k^hel-/ (to play)

Test item 2

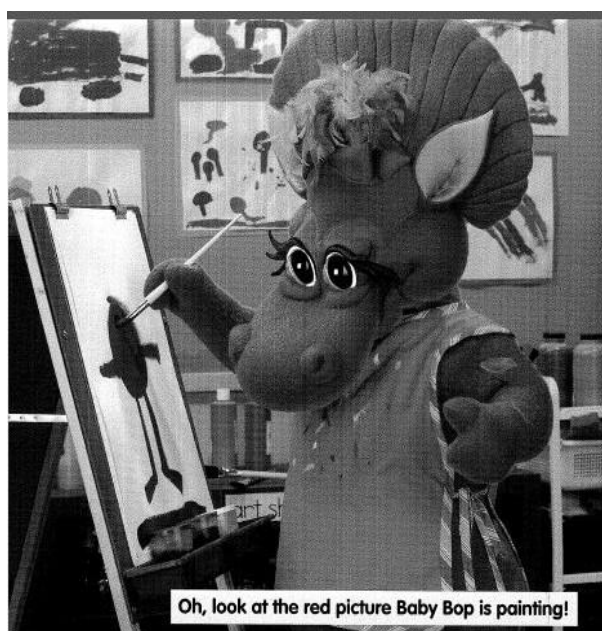
Verb stem: /k^hawa-/ (to feed)



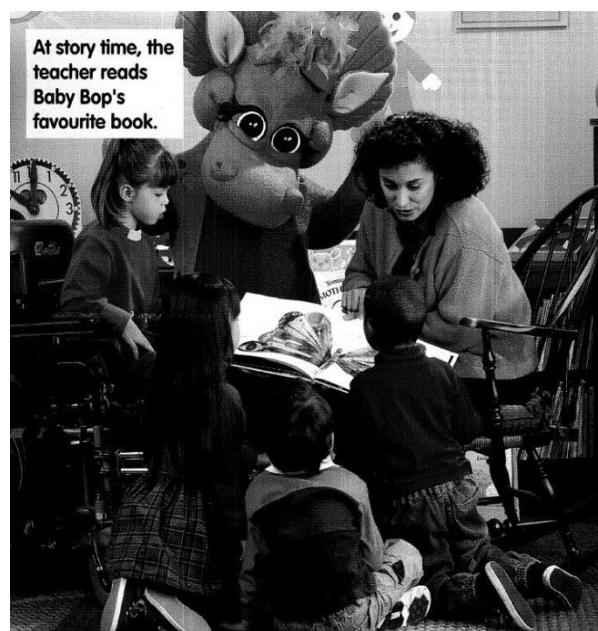
Test item 3
Verb stem: /baja-/ (to play an instrument)



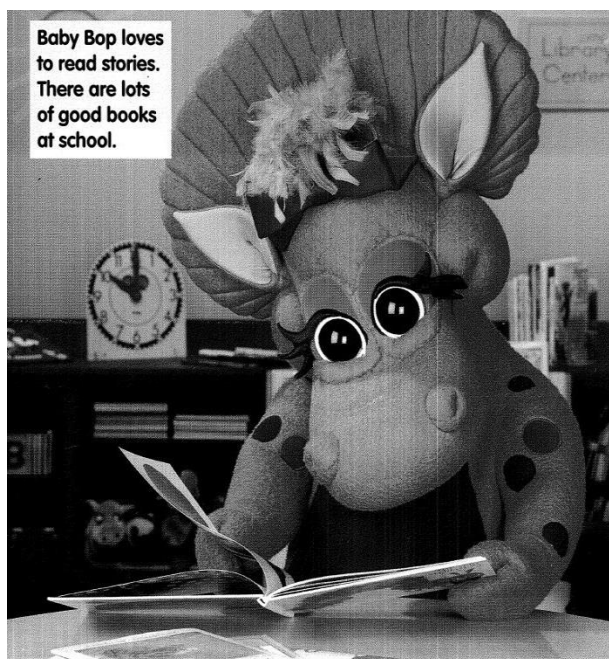
Test item 4
Verb stem: /nach-/ (to dance)



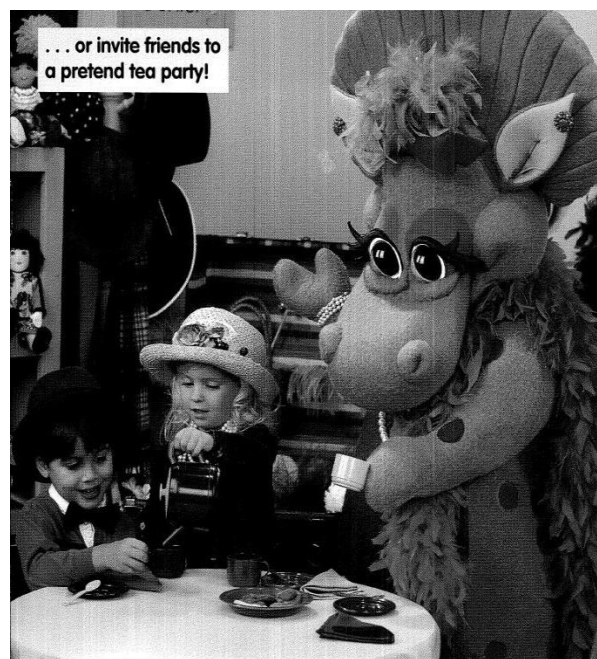
Test item 5
Verb stem: /āk-/ (to draw)



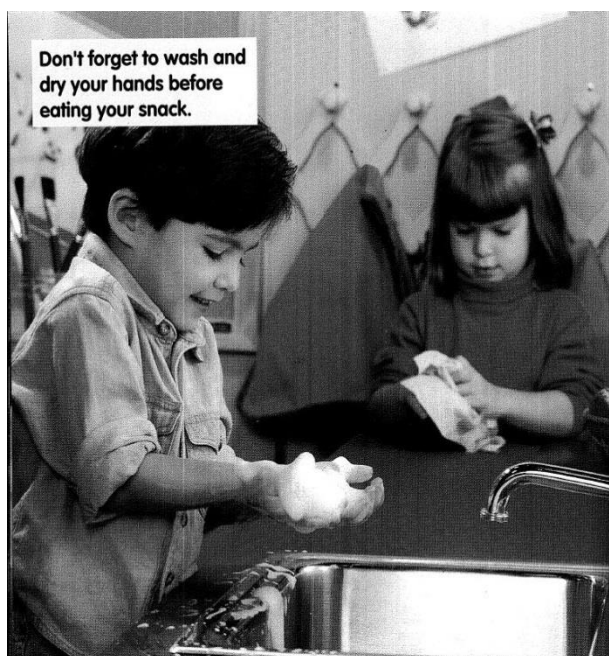
Test item 6
Verb stem: /shona-/ (to tell a story)



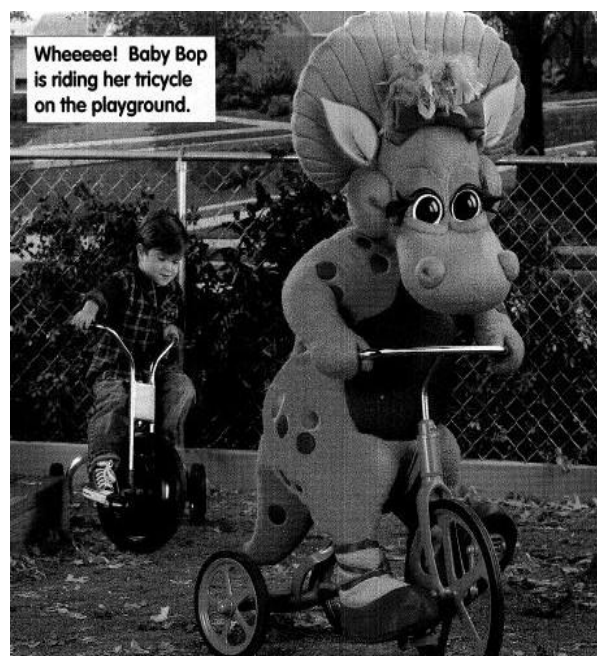
Test item 7
Verb stem: /por-/ (to read)



Test item 8
Verb stem: /d^hal-/ (to pour)



Test item 9
Verb stem: /d^ho-/ (to wash)



Test item 10
Verb stem: /chala-/ (to ride)

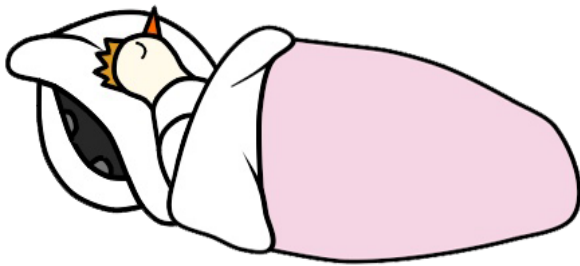
Appendix C

Picture stimuli for the past progressive task



Trial set 1

Verb stem: /j^hul-/ (to swing)



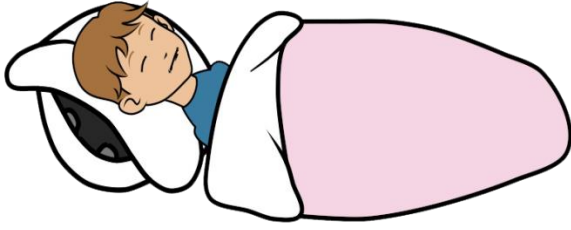
Trial set 2

Verb stem: /ur-/ (to fly)

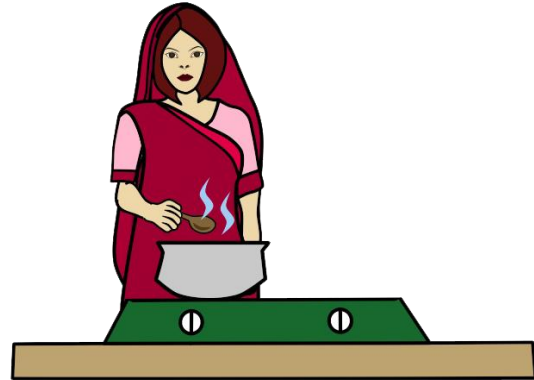


Test set 1

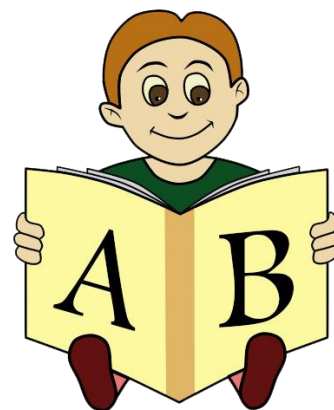
Verb stem: /kād-/ (to cry)



Test set 2
Verb stem: /k^hel-/ (to play)



Test set 3
Verb stem: /ranna kor-/ (to cook)



Test set 4
Verb stem: /por-/ (to read)



Test set 5

Verb stem: /nach-/ (to dance)



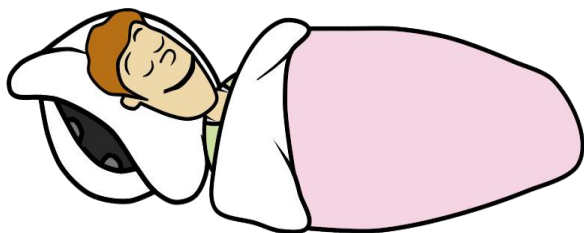
Test set 6

Verb stem: /shātar kat-/ (to swim)



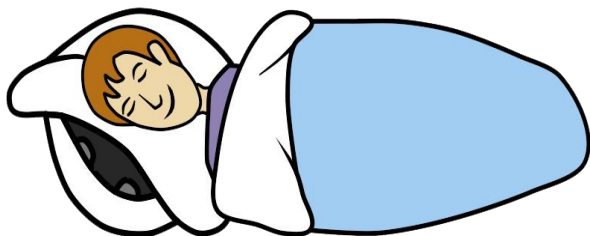
Test set 7

Verb stem: /much^h-/ (to wipe)



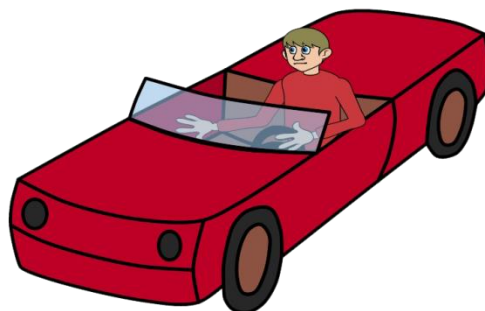
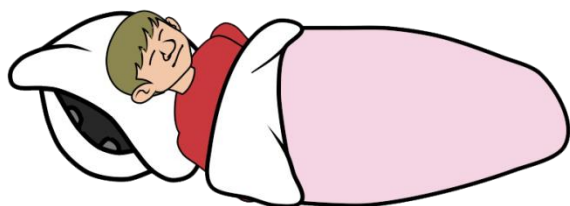
Test set 8

Verb stem: /k^ha-/ (to eat)



Test set 9

Verb stem: /doura-/ (to run)



Test set 10

Verb stem: /chala-/ (to drive)

Appendix D

A picture of the task setting at the daycare centres/ special school

